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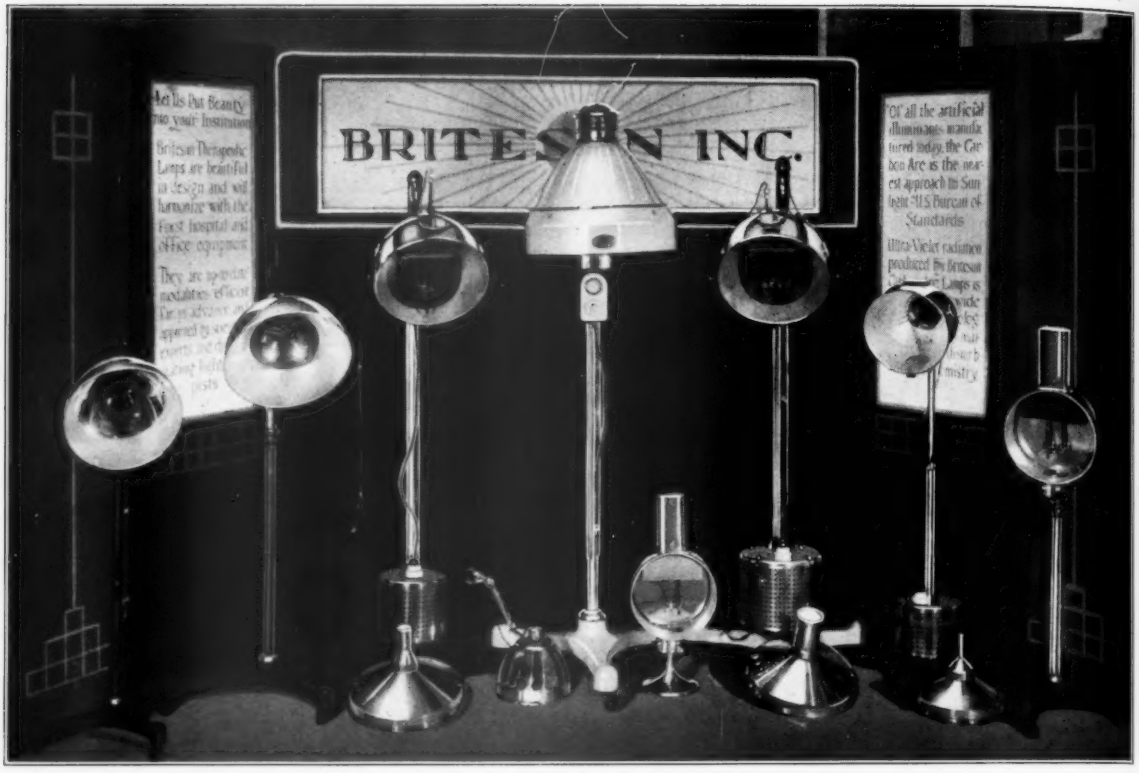

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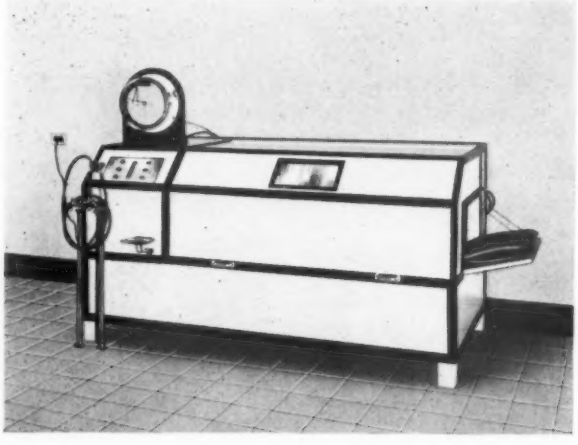

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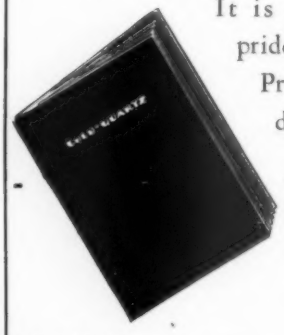

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THE TREATMENT OF CHRONIC ARTHRITIS OF THE SPINE *

LORING T. SWAIM, M.D., AND JOHN G. KUHNS, M.D.

BOSTON, MASS.

The ideal of therapy in any disease is a restoration of anatomic structure and a return of normal function. Unfortunately, this is rarely obtained in arthritis of the spine. The slow onset of the disease, with extensive pathological changes before treatment is sought, and the nature of the disease process in the spine and its contiguous structures make the realization of such an ideal difficult. It will be obtained, we believe, only when treatment is begun with the appearance of the earliest symptoms and when this treatment meets adequately both the general hygienic and the orthopaedic requirements of the individual case. Effective treatment of arthritis of the spine requires a knowledge of the pathological lesions.

Differentiation of Pathology of Spine

The pathology in the spine differs in the two great types of arthritis — atrophic arthritis and hypertrophic arthritis. The history, clinical findings and roentgenograms should make the differential diagnosis of these two types of arthritis a fairly easy matter.[1] Hypertrophic arthritis of the spine is seen frequently in elderly persons,[2] but it rarely leads to serious disability.[3] On examination, one will usually find some limitation of motion in the spine, and in the x-rays a nodular enlargement at the edges of the vertebral bodies with occasional extension of the process into the vertebral ligaments. The gross pathology is typical of hypertrophic arthritis in other parts of the body.[4], [5] This disease never progresses to ankylosis of the spine, but at times it results in marked limitation of motion. Because of this limited mobility, the spine with hypertrophic arthritis has a great potential of strain, which at times produces temporary disability. Usually the only treatment required for relief from pain, where strain occurs, is complete rest in bed for a short period, followed by the use of a properly fitted back support. This support protects the spine against sudden unguarded movement and relieves strain from faulty body mechanics. The occurrence of nerve root pain in hypertrophic arthritis is common.[6], [7] Hypertrophic arthritis is mentioned here only to avoid confusion between the two classical types of arthritis of the spine — hypertrophic [10] and atrophic.[11], [12] The subsequent discussion will be limited entirely to the atrophic type of spinal arthritis.

Occasionally one sees a patient with slight stiffness of the spine and pain on motion, but with little or no tendency to deformity or progression to ankylosis of the vertebral or costovertebral joints. As a rule roentgenological examination of such a patient will show no changes in the spine. Nor does this syndrome present refractoriness to treatment. It is usually cured by the removal of infections in the body or by the correction of faulty hygiene and bad body mechanics.[13] However, spinal arthritis of this mild type is very rare.

Pathological Changes in Atrophic Arthritis

In atrophic arthritis of the spine early pathological changes occur almost simultaneously in the vertebral articular facets and in the spinal ligaments. There are no early pathological observations on record. Most studies have been made on advanced cases of the disease.[14], [15], [16] Apparently, the arthritis begins in the spine as a perithecal fibrositis [17] or as an inflammation of the synovial membrane of the vertebral joints,[18] and is a diffuse periarticular process.[19] This early inflammatory process is followed by the usual changes which occur in atrophic arthritis affecting joints in other parts of the body.[20], [21], [22] Our knowledge of the earlier pathological lesions has been obtained chiefly from the clinical findings in patients, and from x-ray studies. The earliest change observed in x-rays has been an osteoporosis of the entire spine [23] with bony atrophy in other parts of the skeleton as well.

With the onset of symptoms suggestive

* From the Robert Breck Brigham Hospital, Boston. Received for publication August 15, 1932.

Fig. 1. Anteroposterior view of spine in a very early atrophic arthritis, showing marked atrophy of the bone and clouding of the intervertebral joints.

of spinal involvement there is usually found a clouding of the articular facets of the vertebrae, and especially, increased density in many of the spinal ligaments. (Fig. 1.) This is followed by ankylosis of the intervertebral and costovertebral articulations, and by calcification and ossification of the joint capsules [24] and spinal ligaments. The same pathological changes have been found in microscopic sections from spinal joints and ligaments [25], [26], [27] as in the joints of the extremities — a proliferation of the synovial membrane, pannus formation, destruction of cartilage, fibrous and bony ankylosis in the spinal joints. (Fig. 2.) The disease in advanced cases involves as a rule practically the entire spine; but it is possible for only one area, or scattered areas, to be involved.

The disease shows a tendency to spread in untreated patients to other areas of the spine. Often it is first noticed in the sacroiliac joints and extends upward. The intervertebral fibrocartilages often remain, as far as can be determined unchanged,[19] except for atrophy produced by the rigidity of the spine.[28], [29] Where the intervertebral fibrocartilages disappear, osseous fusion between the vertebral bodies usually occurs. In a large number of patients suffering from atrophic arthritis of the spine, the hip or shoulder joints are also involved — the so-called *spondylose rhizomyelique* of Marie.[11] One feature more marked in spinal arthritis than in atrophic arthritis in other parts of the body is the calcification and ossification of the spinal ligaments. Various theories, such as chronic trauma,[31] prolonged hyperemia about the ligaments, [32] a twisting stress [33] acting upon the joint, lowered carbon dioxide content of the tissues [34] favoring a deposit of calcium — all have been advanced. None of them is wholly satisfactory.

The changes that are produced in and about the neural foramina of the vertebrae, result in various degrees of nerve irritation.[35] This may be due to bony proliferation in the ligaments about the foramina, to thickening of the vertebrae itself, or to swelling of the soft tissues about the foramina producing pressure upon the nerve.[36] Another pathological change of significance is the atrophy of the thoracic and spinal musculature with fixation of the thorax in a position approaching full expiration.[37], [38], [39], [40]

With the gradual progression of the disease, the spine becomes less mobile, and

Fig. 2. Lumbar spine, showing disappearance of intervertebral discs, fusion of vertebral bodies, fusion of articular facets, calcification of ligaments.

eventually wholly stiff in a position of forward flexion.[41] The hip and shoulder joint, which are frequently involved, also go on to ankylosis and deformity unless they are carefully watched. When untreated, the costovertebral joints also progress to ankylosis with the ribs fixed in a position of expiration — thus greatly decreasing the vital capacity of the chest. With the increasing limitation of movement in vertebral, costal, hip and shoulder joints, a slow, progressive atrophy of the deep back muscles, of the accessory muscles of respiration, and of the muscles about the hip and shoulder, occurs. This permits further deformity, and delays convalescence after treatment has been instituted. (Fig. 3.)

The rigidity of the thorax is the most serious feature of all. First carefully described by Goldthwait,[42] it has come to be of increasing significance with greater knowledge of the physiological disturbances it produces. The chest, more or less fixed in the expiratory phase, greatly hinders respiration and circulation. No strenuous exertion can be engaged in because of the inability to fully ventilate the lungs.[43] Untreated, such patients develop increasing deformity with increasing physiological disturbances in the thoracic and abdominal viscera.[44] Eventually death occurs, usually from nephritis, tuberculosis or bronchitis,[41] as a result of inadequacy of respiration and of circulation.[37] The deaths, occurring in spinal arthritis in patients whom the authors have followed, have been due either to chronic nephritis or to pneumonia.

Importance of Early Recognition of Changes

Since so much depends on the early recognition of the disease before irreparable damage has been done to the spine, it is well to keep in mind the early signs and symptoms which are commonly observed. These are first, changes affecting the general health of the individual, for atrophic arthritis of the spine is a generalized disease, as is atrophic arthritis of other parts of the body.[45] These patients frequently complain of easy fatigability, vague pains, and stiffness in the back associated with motion.[46, 47] One of the most annoying, as well as one of the earliest symptoms to call attention to the spinal disease, is an irritation of the spinal nerves producing referred pain. More rarely herpes zoster or actual paralysis of muscles may occur. Sensory disturbances in the nerves involved by the arthritic process have been reported, but these are not common.[30]

On physical examination these patients show at first a slight forward bowing of the cervical and dorsal portions of the spine with an absence of lumbar lordosis and a flattening of the chest. Limitation of motion in the spine with pain and muscle spasm are frequently found, but the stiffening of the spine may occur without any symptoms, the rigidity alone giving the clue as to the diagnosis. A little later normal extension of the spine is lost; motion in the ribs becomes less; and finally is completely

Fig. 3. Severe atrophic arthritis of spine, showing bowing of the spine, flattening of chest, visceroptosis, and marked atrophy around the hip and shoulder.

lost. Often no expansion of the chest is found in respiration. Visceroptosis is usually present; intestinal stasis is the rule.[17] Patients with spinal arthritis usually do not show in as marked a degree vasomotor instability, anemia, and low blood pressure, as do patients with general atrophic arthritis. With the onset of symptoms, the x-rays often show no definite changes in the spine.[50], [51], [52], [53], [54] An increase in the density of the spinal ligaments is one of the best early signs and should be looked for carefully. In spinal arthritis, x-rays should be used only for confirmation of the clinical findings, and should not be relied upon for diagnosis, particularly in the early stages of the disease. (Fig. 4.)

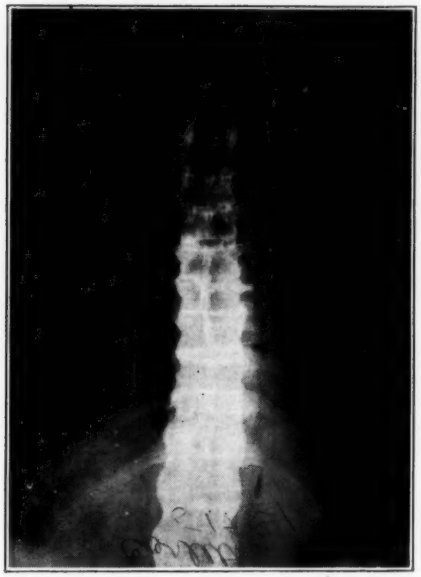
Because of the serious deformities and limitation in activity which the disease produces, and especially, because of its effects on the general health of the individual, treatment must be undertaken immediately on the recognition of the disease. When tenderness, deformity and severe pain have appeared, much time has been lost. Only in the last few years have attempts been made to cure the disease at the same time that effective measures were being used to prevent deformity and secure useful function in the ribs and spine. The fact that patients are being seen in the earlier, rather than in the advanced stages of the disease, has also made the outlook for therapy much more hopeful. From the above discussion of the pathological changes and functional disturbances, we can postulate certain essentials in treatment of arthritis of the spine:

1. Arrest of the disease as quickly as possible.
2. Improvement in the motion of the ribs.
3. Correction of the forward droop of the spine.
4. Improvement in the general health of the patient.

Treatment of Arthritis

Medical science has as yet offered us no rapid method of cure.[55] Cure comes only by gradual improvement in the general health, and by increasing the resistance of the patient. While rapid improvement has been occasionally observed with the use of drugs or vaccines alone, such improvement in the experience of the writers, is never lasting unless other measures, designated to improve the general condition of the patient are added. These include dietary regulation, adequate intestinal elimination, endocrine therapy, if indicated, the correction of faulty body mechanics by exercises and positions of rest, and the maintenance of good body mechanics by supports until the limit of cor-

Fig. 4.



A. Showing marked atrophy of bone; narrowing of intervertebral discs; fusion of spinal ligaments; ankylosis of costovertebral joint.

rection of the spinal deformity is obtained. Treatment, in fact, is in many respects similar to that for tuberculosis of the spine. It is our belief that restoration of rib motion and increased expansion of the chest are vital to recovery. These are the most important points in treatment, and without these all other improvements are af little benefit. A certain minimum of vital capacity is necessary for activity,[56] and the heart and lungs must have space in which to work.

We believe that a diet rich in vitamins and mineral salts and low in carbohydrates, with the carbohydrate consisting chiefly of whole wheat; a diet largely of milk, fruit, vegetables, and a moderate amount of meat, has been of value. Such a diet must be used for months to have any permanent effect. The gastrointestinal function must be carefully watched, and an attempt is made to secure adequate intestinal elimination.[57] In cases not too ill[17] elimination through the skin can be increased, and pain lessened through steam baths given several times a week in the Wilde Cabinet. The muscle spasm that accompanies the arthritis can be, in large part, controlled by rest in bed and by the local application of moist heat to the spine.[41] Infection, unless apparently quite active, is disregarded,[58] except in the use of general measures calculated to increase the body's resistance, until the general condition of the patient can withstand any measures necessary to eradicate that infection without serious depletion of the patient's general strength.[59] Much emphasis has been placed in the past upon gonorrheal infection,[60] but recent investigators have not found it in many cases.[61] In the experience of the authors no active gonorrheal infection was present in any of their cases, but a small number of cases gave a history of gonorrhea in the past. Endocrine products have been employed for circulatory stimulation where there was definite evidence of endocrine deficiency.[62]

It was found that the arrest of the active disease was greatly hastened by rest, relief from strain, and by the improvement resulting from increased vital capacity and increased circulation. Clinical observation of the cases of spinal arthritis suggested that the greater the forward bowing of the back and the fixation of the ribs, the less was the resistance to the disease and the worse, the prognosis. It has been our experience that if the bent back could be straightened, and the rib motion regained, the duration of the active disease was shortened and the ultimate prognosis was

Fig. 4

B. Lumbar spine of same patient showing ossification of spinal ligaments and of lumbo-sacral ligaments.

better. Particularly was this true in the early cases.

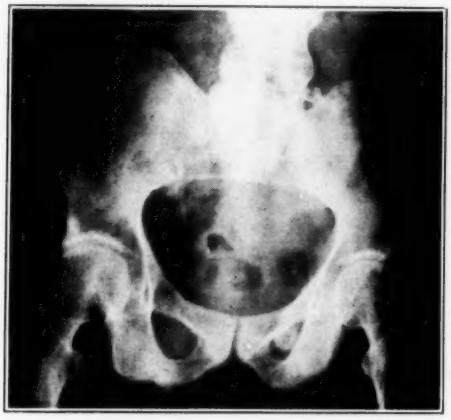
In most cases of untreated spinal arthritis, the active disease stops eventually; but usually the deformity is so marked and interferes so seriously with the normal function of the thoracic and abdominal viscera that a normal life is impossible. Active disease of one type or another ultimately supervenes and is usually rapidly fatal. Under treatment, however, it is surprising to see how rapidly the general health returns when rib motion increases and the dorsal spine is straightened. The anemia, if present, slowly disappears; the blood pressure and the temperature approach the so-called normal; weight is gained, and constipation ceases. One of the striking changes is a better superficial circulation. The ultimate prognosis in these patients is largely dependent upon the improvement in rib motion and upon the amount of correction of the forward bowing of the dorsal spine.

Corrective Exercise and Manipulation

We believe that those suffering from arthritis of the spine should not be ambulatory during the acute stage of the disease, especially during the periods of pain, stiffness and muscle spasm. Treatment in bed is the best way to give rest for the muscles and inflamed ligaments. It gives the body an opportunity to increase its powers of resistance; it conserves energy; it also affords an opportunity for correcting the bowing of the back. While the patient is resting in bed, no position should be permitted which produces spinal or thoracic deformity. Sitting and walking should not be allowed until all pain and muscle spasm have disappeared. Corrective exercises, such as breathing, abdominal exercises and rib stretching exercises can be given while the patient is in bed, with benefit and improvement in chest expansion, vital capacity and circulation. In many cases, increase in excursion of the ribs may seem impossible when the case is first seen, but there are few cases even with apparent costovertebral ankyloses where an increase of at least an inch in thoracic expansion, and a definite increase in vital capacity, cannot be obtained.

Where the ribs become solidly ankylosed in spite of treatment before the disease is arrested, this ankylosis should be permitted to occur only in a position approaching full inspiration. This can be accomplished by the continuous use of plaster shells or jackets which exert pressure upon the angles of the ribs, posteriorly, and which secure the greatest possible extension of the spine. Improvement in the functional use of the spine can be obtained in all cases not

Fig. 4.



C. Pelvis of same patient showing fusion of sacro-iliac joints; narrowing of the joint spaces in both hips.

already ankylosed, but full correction of the forward bowing can be obtained only when treatment is begun early before much ligamentous calcification has occurred. Even better than correction is the prevention of all deformity by full recognition of the tendency of the disease to produce deformity and by the early use of corrective positions in rest, followed by a corrective spinal support.[44] Forceful manipulation for partial correction of the spinal deformity has been reported recently.[63] The authors, however, advise against any forceful manipulative attempts at correction of the deformity, since they have seen catastrophies occur with manipulations of arthritic spines even in careful hands.

In a large number of patients suffering from spinal arthritis at the Robert Breck Brigham Hospital, an attempt has been made to secure the essentials of treatment previously stated. Briefly, the procedures have been these: On admission to the hospital, the patient has been put to bed immediately, and, except in the milder case where symptoms were less severe, was not permitted to get up even for meals or bathroom privileges. Complete rest in bed has been necessary for a fairly long time — a month or more. Where there was marked forward bowing of the spine, enough pillows were allowed at first to make the patient comfortable; but these were gradually removed in order to stretch the back and correct deformity. After several days of complete rest, active stretching of the spine was begun, its aim being both the straightening of the back and the expansion of the contracted chest. This has been the most important single factor in treatment; because if arthritis of the spine ever proved fatal, it was due to a gradually increasing embarrassment of the circulation and a disturbance in the function of the abdominal viscera, which were inevitable sequelae of the compression deformity of the chest and spine.

Gentleness the Keynote of Therapeutic Exercise

For this reason, after the initial rest in bed, measures were begun to prevent, or correct, the forward bowing of the chest and the fixation of the ribs in their position of extreme downward inclination. This was done by giving breathing and rib-stretching exercises to increase the thoracic capacity, to mobilize the costovertebral joints and to strengthen the back muscles and the accessory muscles of respiration. Here one was guided in the amount of exercise given largely by the amount of pain and muscle spasm resulting. No treatment should increase pain or add to the spasm of the muscles. After several days of such mobilizing exercises, attempts at gradual correction of deformity were begun. Gentleness was the keynote here. Gravity was able to correct any deformity present if it was correctable, and a much better result was obtained by gravity alone[64] than if forceful methods were used.

With the patient supine on a firm bed, a small pillow was first used for periods of a half hour several times a day. This pillow

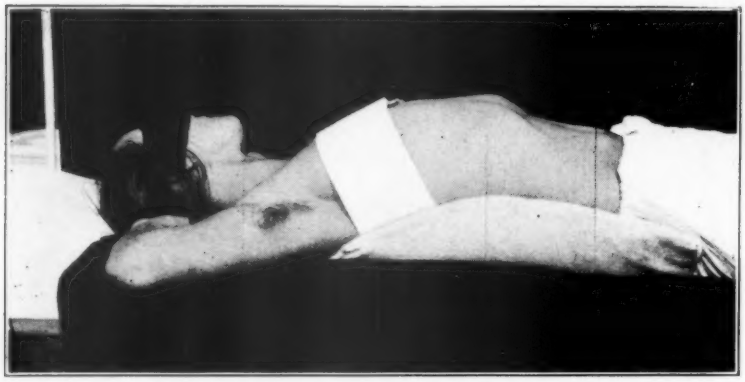


Fig. 5. Showing the effect of an especially molded plaster shell upon the ribs.

was placed under the most prominent point of the spinal deformity. The small pillow was replaced in time by a larger one, or by a small sand bag. If there was much difficulty in securing motion in the ribs, a posterior shell, or plaster jacket, was used with ridges so molded into it that they would exert pressure upon the angles of the ribs posteriorly. (Fig. 5.) If a plaster jacket was used, it was made to fit tightly over the abdomen. This diminished abdominal breathing, and encouraged upper chest expansion. Restriction of the abdomen in this way never caused any discomfort. Back shells, or jackets, were rarely worn continuously. They were changed at frequent intervals, as more correction of the spine, or motion in the ribs, was gained.

When no further correction could be secured, or when the active disease seemed quiescent, exercises were given with the patient sitting up — first on the edge of the bed, and later in a chair. During this time, it was necessary to be on the look-out for active muscle spasm or a return of pain, as progress was dependent on the absence of muscle spasm. With the gradual improvement in general well-being, which almost always followed the straightening of the spine and the increase in the motion of the ribs, and with the subsidence of the pain and muscle spasm, the patient was allowed up for gradually increasing periods each day.

At first the patient wore a well-fitting plaster jacket, or a back brace, to hold the spine, so that strain upon the weakened back muscles and spinal joints, as well as a recurrence of the spinal deformity, was prevented. This presupposed, of course, proper fitting of the support. Ultimately, as the musculature of the patient became strong enough to correct and hold the improved position without slumping, this support was discarded. After treatment in bed was discontinued, frequent short rest periods in the position of hyperextension of the spine were given during the day, over a long period of time, in order to prevent continued strain or the long assumption of faulty attitudes. Frequent medical examinations were needed to see that continued good hygiene was carried out so that no relapse of the disease, or return of deformity, occurred. (Fig. 6.)

Mention should be made of the fairly frequent involvement of the hip or shoulder joints in this disease, which has presented one of the most obstinate features in treatment. In these cases, an attempt to prevent deformity has been made by rest, traction, plaster casts and exercises.[44] With rest, good hygiene, and local heat, the arthritic process usually quieted down in the hip or shoulder just as it did in the spine. Exercises were necessary to prevent atrophy of the muscles.[65] In advanced cases operative procedures were occasionally necessary to secure motion at the hip or shoulder joints.

The prevention of the extension of the disease to the hips, and the treatment of these hips in order to prevent severe damage or ankylosis of the joints has been the most difficult problem encountered in all of the cases of spinal arthritis. So far, we have had little success in keeping the affected hips movable. They have ankylosed frequently in spite of all efforts to prevent it in cases where the disease had actually

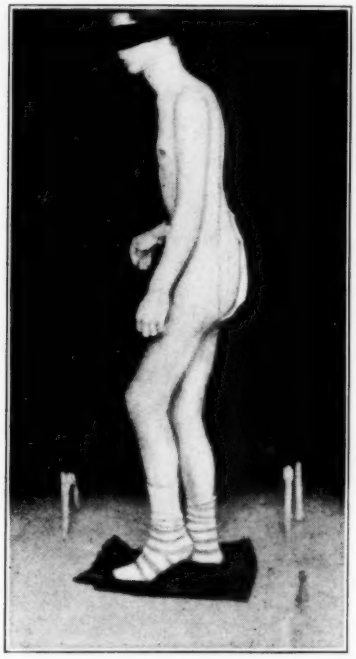


Fig. 6A. Patient with severe atrophic arthritis of the spine. Note the forward angulation of the spine, flattening of the chest, and general muscular atrophy.
Weight, 121 lbs.
Vital Capacity, 1300 cc.

started in the joints. The pain was often extreme; no exercise seemed possible; up to the present time all methods of rest, exercise, traction or protection, have not kept the hip joint movable. Positions of serious deformity have been prevented, but normal function has not been retained except in a very few early cases. Further study to prevent stiffening of these hips is sorely needed.

Summary

The above outline is not given as an ideal treatment. It is submitted only as an attempt to meet the many-sided problem presented by atrophic arthritis of the spine. It is the result of many discarded methods and much experimentation in an endeavor to secure the best functional recovery. (Fig. 6.) One of the most important observations in attempting to care for these patients with spinal arthritis is that as soon as the vital capacity and expansion of the chest is increased, the weight, circulation and strength of the patient improves; and the progressive tendency of the arthritis decreases. Once started, the tendency to improve gains headway, and although the spine may become stiff, if it is straight, motion in the ribs is not again lost. This motion may not be complete, but the ribs remain movable within the range of motion regained. This is not true if the chest is collapsed and the back bowed. Then the tendency is to lose vitality and health; and the prospect of length of life is greatly diminished.

Atrophic arthritis of the spine is a fairly common disease which must be recognized early if good functional recovery is to be obtained. Treatment must be an attempt to secure the greatest possible approach to a normally straight back. Good treatment must include: 1, Arrest of the disease as quickly as possible; 2, Improvement in thoracic function by increasing motion of the ribs; 3, Improvement, correction, or prevention of deformity of the spine; 4, Improvement of the general health.

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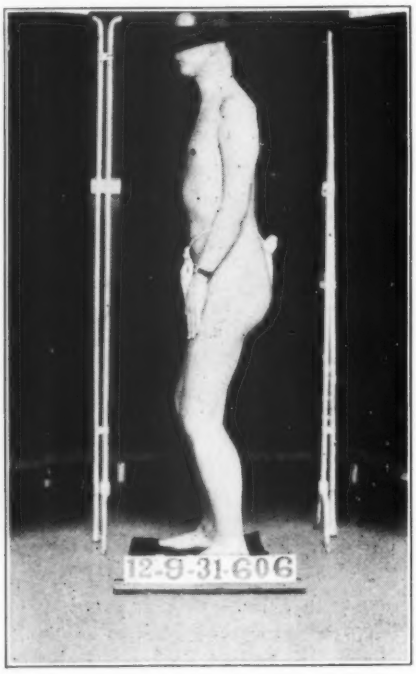

Fig. 6B. Same patient 2 years later. Note the almost complete correction of spinal deformity, increased depth of chest and good muscular development.
Weight, 160½ lbs.
Vital Capacity, 2150 cc.

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A SUMMARY OF APPROXIMATELY ONE HUNDRED CASES OF OTITIS MEDIA TREATED BY ZINC IONIZATION *

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In this paper we hope to report some conclusions of interest in regard to the zinc ionization treatment of otitis media. No special effort to review the literature will be made. Rather we will report our own observations and conclusions as to technic, indications for the treatment and more especially the contraindications to zinc ionization treatment. We hope that the series will be of interest as the complicating factors seemed to be rather well worked out in our records. The follow-up records were not complete, however, as many of the patients failed to reply to letters requesting an interview.

Ninety-one cases were investigated. As a result of these investigations it is our impression that those patients who were improved or cured are more apt to return for observation than those who may have received less satisfactory results. Thus, the final figures are probably somewhat optimistic.

Cases discarded in the final figures include a large number in which operative work was done immediately before or during the series of zinc ionization treatments so it was impossible to judge fairly as to whether result was due to this operative influence or to the zinc ionization. Some additional cases were discarded on account of inadequate follow-up and subsequent failure to reply to the questionnaire sent out. Others were discarded on the basis of having had a single treatment only. Some patients had bilateral otitis media with different complications on each side. These were treated as individual problems and so summarized.

We wish to emphasize, too, that however satisfactory an "improved" patient may be in some lines of medical work, that those classed under this heading in our classification either still have a discharge, though decreased in amount, or have had a recurrence of discharge. For these reasons in those patients classified as improved, the result must be considered to be less satisfactory than at first might seem apparent.

Technic

The ear canal was cleaned by a member of the otolaryngological staff and packed with clean gauze. The physical therapy technician then saturated the gauze with 2 per cent zinc

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sulphate solution. The usual technic was modified to the extent that a large saline saturated pad was placed well anteriorly on the opposite cheek; i.e., in the direction of the ear canal and not on the opposite ear. Neither was a zinc electrode used as an active electrode, as it should be obvious from physics that the time required for the migration of a heavy ion from the level of the pinna to the middle ear is too long to ever take place in an ordinary treatment period. It also seemed advisable to have the ions in solution before treatment and near the pathological area rather than to depend, possibly, upon a slightly oily surface for the production of the ions, even though the matter of speed of migration could be overlooked. We did, however, express the solution every five minutes and instill fresh solution. We feel now, however, that as the treatment generally resulted in the expression of much mucopurulent material, we would have improved our technic by removing both gauze and old solution every five minutes. We used 1—3 m. a. for fifteen minutes, connecting the positive pole to the active electrode. Dizziness in the patient was avoided by turning the current on and off very slowly.

Indications

Patients with chronic otitis media and having a serous discharge with a good sized perforation of the membrane with no polyps, cholesteatomata, obvious mastoid infection or grossly pathological adenoids, were considered to be cases in which the treatment was indicated. The final results are shown below:

Table I

TOTAL CASES OF OTITIS MEDIA:

1. No. cases with followup- (total)..60
2. No. cases (treatment indicated)....36
3. Results in indicated cases:

Cured—20	55%
Improved with temporary cure with relapse—15	42%
Unimproved—1	3%

In all patients with otitis media not conforming with the previous indications zinc ionization was not considered to be indicated. This treatment was particularly unsatisfactory in the long run in all patients in which surgical intervention was obviously necessary. Those patients having a low grade mastoid infection, pathological adenoids, cholesteatomata, aural polyps, or a small perforation of the membrane, were considered to be cases in which the treatment was contraindicated. Even a bloody or purulent discharge should be considered a contraindication to zinc ionization as the zinc precipitates upon the discharge. Our results in this group are indicated as follows:

Table II

RESULTS IN CONTRAINDICATED CASES:

Total number of cases with known contraindications	24
Cured—6	25%
Improved—14	58%
Unimproved—4	15%

Conclusions

I. Zinc ionization is indicated in the absence of the contraindications mentioned above if the patient exhibits a serous discharge from the middle ear and a good sized perforation of the tympanic membrane. In such cases the treatment should be almost specific, especially in those patients with a history of a chronic discharge.

II. In the great percentage of cases of otitis media, zinc ionization can only be expected to produce palliative results until the indicated surgery is completed. In this group is included all of those patients having a bloody or purulent discharge and especially those needing a mastoidectomy or adenoidectomy.

III. Zinc ionization as applied to the middle ear is merely a more effective method for the application of an astringent than the topical method and should only be used as such.

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RADIATION THERAPY IN MEDICINE: ITS FUNCTION AND APPLICATION *

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With advancing years human beings grow increasingly susceptible to various diseases that are more or less chronic and that hasten the approach of death. From time immemorial, therefore, it has been deemed the special task of the physician to stave off the fatal moment as long as possible and prolong life to the uttermost. Even more, he is expected to prolong that existence in such manner that the patient continue as a useful member of society. Accordingly, palliation of disease is considered to be one of the major goals of the practitioner, his crowning achievement in contributing to the welfare of humanity.

While specific remedies have been discovered for many of the diseases that cause death, no single cure has yet been found for cancer, that most dreaded scourge of our generation, whose harvest has increased a hundred-fold during the past decade. The plight of the sufferer from a chronic disease is sad enough, particularly if, because of illness, he loses his means of earning a livelihood and becomes either a burden to his family or else a public charge. Infinitely worse, however, is the condition of the cancer sufferer who must bear in addition the loathing inspired by this dread disease in the minds of the rest of the world. The necessity of concealing his affliction from those with whom he associates induces a mental depression and an inferiority psychosis that grows constantly greater until death mercifully relieves the victim.

It is because of this universally hopeless attitude toward cancer that the discovery of any new weapon for combating this scourge, such as irradiation, is hailed enthusiastically the world over. Just as was the case with other phases of medicine, however, the early overenthusiasm for this supposed panacea quickly led to its abuse, with resulting tragic fatalities to both employers and recipients of this type of treatment. Not until a number of years had elapsed and numerous untoward experiences encountered was it realized that this new kind of therapy demanded a specialized knowledge for its proper employment in medicine.

One of the happiest of discoveries has been the knowledge that irradiation proves valuable not alone in malignancies, but that even

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benign lesions are found to be amenable to this type of treatment, thus considerably enlarging its scope of usefulness in medicine. As far as we know today, both radium and x-rays act alike biologically and so the determination as to which agency to use depends upon the type and form of lesion to be treated.

Treatment of any local malignant lesion is most effective when the whole area involved can be completely removed or totally destroyed *in situ*. Whether the procedure be surgery or irradiation, this is possible only when the lesion is of limited extent. Of course, the earlier a malignant growth is seen the more possible is its eradication.

In the case of large bulky tumors, it is often advisable and even necessary to remove as much as possible of the local growth and then irradiate what is left. The method employed in the excision of malignant growths depends on the condition present. An infected vascular growth prone to hemorrhage is best removed by the high frequency surgical method. Where primary healing is required and clean surgery can be done, the skillful sharp scalpel is the preferred procedure.

In all procedures where radium is used either intratumorally or intraorificially the same aseptic, careful technic that is used in pure surgery is essential for good results.

In general, x-rays are employed (1) as a curative measure in treating large lesions, (2) for inaccessible lesions, (3) for general metastases, (4) in association with surgery as a pre- and post-operative form of therapy, (5) as an adjunct to radium therapy, (6) and as a palliative measure in hopeless cases.

Because the abnormal pathological cell does not remain localized, any treatment directed to the patient must include not only the local lesion, but also such areas as already are or may become involved in a metastatic manner. In those cases where bone metastases exists or where diffuse, large lesions occur, palliative employment of x-rays often relieves pain and prolongs in comfort the life of the patient, because x-rays have a definite analgesic action.

Radium is employed (1) for the direct treatment of tumor growth by direct superficial contact and by direct application intratumorally or intraorificially, (2) together with surgery, (3) in the form of a surface pack where large quantities of radium are available.

The aim in irradiation is to destroy pathological tissue in such a way as not to injure the overlying or normal surrounding tissues, allow the surface epithelium to recover entirely, and to stimulate the normal body reparative processes.

In some conditions it is the treatment of choice, for others it is used as an emergency measure, and in still others it is the only therapy capable of bringing on beneficial results. It should be borne in mind, however, that while inadequate, incomplete or even poor surgery can be remedied, improper irradiation may make a bad condition even worse, in most cases virtually impossible to repair; and for that reason it must be employed only by those skilled and trained in its technic, and then only where proper, adequate apparatus and a suitable supply of radiant energy are on hand.

For our treatments we use x-ray, radium and the high frequency current. We have no set form of treatment but utilize that procedure which we deem proper, basing our judgment upon clinical experience and fundamental physical principles.

In decided contrast to the early procedures and methods of irradiation we have found at present that good work can be done only with proper apparatus built in accordance with specific physical factors as evolved through study and experience. The employment of special type tubes, filters, etc., has given way to a more uniform irradiation, and by increasing the voltage to approach more nearly the production of x-rays equal to the gamma rays of radium.

Newer methods of administering the x-rays to the body over a longer period of time and in divided doses have been found to give better results, and that by altering certain physical factors in the scheme of treatment, changes in the resultant x-rays produced thereby are delivered to the patient. At times we have changed the voltage used, depending on the type of case to be treated, from 90 KV, to 200 KV, constant potential.

Again, as not all tissues respond alike we have found it of value to vary the filtration from no filter at all for certain benign and malignant dermatological lesions, to several millimeters of copper as employed with the Coutard method.

This latter method we now use regularly

in the treatment of our larynx and esophagus cases. Then, too, in some instances, by altering the target distance and thus varying the percentage of depth intensity we have been able to affect lesions that were unresponsive to x-rays when otherwise used.

With radium, increased doses with a large amount of radium are now being utilized, and in our work we use the element or emanation (Radon) interchangeably. We have, however, learned, as a result of our clinical experience, that in certain instances the gradual deterioration of the radon is most beneficial in securing a slow generalized reaction in the tissues thus being treated. We find radon seeds filtered through gold, a useful and effective method for treating surface lesions, particularly hemangiomas, keratosis, etc.

We have found it convenient and effective to treat many lesions with surface radium irradiation either with simple applicators of wood, wax and rubber, or with the new 5 gram pack, the largest of its kind yet employed anywhere. For intratumoral and intraorificial radium treatments we use tubes of platinum with wall filtration of 1 to 2½ millimeters, and varying in content from 5-50 milligrams radium element. For intratumoral therapy we use radon in the form of gold filtered seeds of 3/10 millimeter wall thickness and varying in content from 2/10 to 3 millicuries, and needles of radium element varying in wall thickness from 0.5 to 0.6 millimeter platinum, and in size from 25 millimeters to 60 millimeters in length, and containing 1 to 6 milligrams radium element each.

For some time now we have employed specially made 6 centimeter radium needles in the intratumoral treatment of breast cancers. In the treatment of tongue lesion the platinum needles of 27-35 millimeters in length and of 2 milligrams radium content have in our hands, proven highly effective.

In short, the ingenuity of the radiation therapist manages constantly to meet the various needs and conditions as they arise.

Indications for Radiation

Radiation is useful in the following conditions: As an emergency measure for enlarged thymus, idiopthic hemorrhages, and where new growths press on some vital structure such as the trachea restricting respiration:

In benign lesions such as:

A. Dermatology:
   1. Acne.
   2. Eczema.
   3. Sycosis.
   4. Lupus.
   5. Hemangiomas.
   6. Keloids.
   7. Pruritis.
   8. Kraurosis Vulvæ.

B. Neurology:
   1. Neuralgia.
   2. Sciatica.
   3. Syringomyelia.
   4. Pituitary Tumors.

C. Gynecology:
   (a) Functional:
      1. Amenorrhea.
      2. Dysmenorrhea.
      3. Metrorrhagia.
      4. Menorrhea.
   (b) New Growths:
      1. Fibroids.

D. Medicine:
   1. Tubercular Adenitis.
   2. Hodgkins Disease.
   3. Leukemia.
   4. Agranulocytosis.
   5. Hyperthyroidism.
   6. Unresolved Pneumonia.

E. Surgery:
   1. Unhealed Bone Sinuses and Soft Tissue Sinuses.
   2. Adenitis.
   3. Post Operative.
   4. Prostatic Hypertrophy.
   5. Vesicle Hemorrhages.

Of course, it is in malignant conditions that irradiation plays its most important rôle. All types of malignant conditions whether primary or secondary, with or without metastases, are more or less amenable to irradiation.

Conditions so treated are: Superficial malignant lesions of the skin and mucous membranes wherever situated throughout the body. Malignant lesions of the brain, head, the oral, nasal and pharyngeal cavities, the esophagus and gastro-intestinal tract, the

respiratory system, the genito-urinary system, the reproductive and genital organs, the breast, the skeletal system, and in cases of generalized malignant metastases.

In some of these lesions radiation is used as the treatment of choice, in others as an accessory agent along with surgery. For epitheliomata of the skin, radium acts rapidly and effectively. In cancer of the cervix, x-ray and radium together have replaced surgical procedures, while in antrum malignancies, surgery plus radium and x-ray therapy is the accepted method of treatment, and for generalized metastases and advanced lesions, x-rays act as a beneficial palliative.

Sarcoma of all types are best treated with irradiation.

Conclusion

Radiation can no longer be regarded as some mysterious, dangerous force, but one that can be called upon for aid in benign and malignant conditions, and not necessarily in only hopeless malignancies. In cooperation with the medical and surgical attendant it now offers a more hopeful and satisfactory prognosis for the patient. It must however, be employed only by those properly qualified by training and experience to make use of this therapeutic agent.*

* Discussion of this paper will be published in a later issue. — Ed.

PHYSICAL THERAPY IN DERMATOLOGY *

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Physical therapeutic measures in dermatology, as ultraviolet light in tuberculosis, are at times very valuable, at others of some value, while at still others they may be of no value or even positively harmful. There is no substitute for a diagnosis, and merely giving an eruption some kind of a name is not sufficient to make some of our rapidly accumulating literature of value. I have several times seen cases presented with a faulty diagnosis, the discussion of which, however, was almost a duplicate of a text book description fitting the diagnosis. The lack of knowledge of even common skin conditions is deplorable; even impetigo, scabies, and psoriasis at times, as well as dermatophytosis, being wrongly diagnosed. Under these conditions it is little wonder that dermatologists are slow to rely upon reports of results in the treatment of this or that disease. Incidently, the number of cases of eczema in any man's practice varies inversely as his ability to diagnose dermatologic conditions.

After the diagnosis has been made there are usually several therapeutic measures of known value available. When this is true, I conceive it the duty of the physician to use one or more methods which will give the most speedy and complete result with the most safety and the least loss of time, inconvenience or expense to the patient. When a physical agent is the method of choice in the cure of the disease itself or in the treatment of some underlying factor, it should be used — but only then.

* Read at the Tenth Annual Meeting of the American Congress of Physical Therapy, Omaha, Nebraska, October 5, 1931.

Skin Malignancy or Epithelioma

Premalignant Lesions. Epitheliomas of the skin are divided into three groups: basal cell, prickle cell and basal squamous cell. Eller and Anderson[1] have given the following as precancerous dermatoses (the letter in parenthesis indicating the type of malignancy arising therefrom):

Syphilis (P).
Leukoplakia (P).
Radio dermatitis (P).
Senile and Seborrheic keratoses (B) or (P).
Kraurosis vulvae (P).
Occupational keratodermas (tar, arsenic, oil, etc.) (P).
Lupus vulgaris and Tbc. cutis (P) or (B).
Blastomycosis (P).
Arsenical keratosis (P).
Sebaceous cysts (P) or (B).
Lupus erythematosis (P) or (B).

Bowen's disease (intraepidermal carcinoma).

Extra mammory Paget's Disease?

Xeroderma pigmentosa (B) or (P).

Chronic ulcers (varicose ulcers, pellagrous ulcers and fistulae), (B) or (P).

Cicatrices (P).

Cutaneous horns (B) or (P).

Paget's disease of the nipple ?

Papilloma of tongue (P).

Paget's disease formerly considered a premalignant lesion is now considered a malignancy from its inception (2), (3), (4), (5), although Pusey does not entirely agree with this.[6] Radical amputation should be done. Extra mammary Paget's disease probably does not exist. Fraser[3] believes these changes are intraepidermal carcinomas.

Premalignant lesions should be destroyed before malignancy occurs. In all of these I prefer high frequency destruction (electrodesiccation, electrocoagulation or endotherm knife, depending upon the case) except sebaceous cysts which may be removed with the scalpel, cicatrices which should be watched and kraurosis vulvae which should have radical surgery.

Epithelioma

Basal Cell. This lesion is locally malignant and does not metastasize. It erodes contiguous tissue, destroying cartilage and even bone. Eighty per cent occur about the head and neck, but it may occur any place except on the mucous membrane. If near the eye it may invade and destroy this organ. In this location postoperative scars are a problem. Basal cell epitheliomas may be destroyed by a number of methods including curett and acid nitrate of mercury (Sherwell method), x-rays, radium, electrocoagulation, scalpel or carbon dioxide snow if the lesion is small and sufficient dosage is given. Pure basal cell epitheliomas usually can be successfully treated with x-rays, MacKee[7] reporting 91 per cent permanent cures in selected cases, and Hazen[8] reporting 93 per cent. Equally good results have been reported by Quick[9] and Quigley[10] when radium was used. One-eighth to one-quarter inch of normal skin beyond the active border should be be included in the irradiated area. Eller and Bucky[11] have used super soft x-rays (*Grenz*) successfully in lesions of the upper lid, but these have failed in lesions of the lower lid. The majority of basal cell epitheliomas respond favorably to 2½ or 3 skin units of unfiltered x-rays (6 inch sp. gp., 3 ma., 3½ or 4 min. at 8 inches without filter). This may be repeated in two weeks after all reaction has subsided. Eller and Fox[12] report equally good results when using a full strength radium plaque with two millimeters of aluminum and one layer of rubber filter that gave 40-60 milligram hours per square centimeter for small lesions.

I prefer destroying small lesions to ⅛-¼ inch beyond the active border with electrodesiccation or electrocoagulation (depending on the depth), following this by curettment with careful observation, making as sure as possible that all the cancer tissue has been removed. Larger lesions are often best completely excised with the endotherm knife. In either event this is followed by one to one and a half skin units of unfiltered x-rays. Lesions involving the cartilage or bone do not respond well to radiation. Here electrocoagulation is the method of choice.

Basal-Squamous Cell. Of all clinically basal cell epitheliomas, 15 per cent to 20 per cent are basal-squamous cell, as proven by Montgomery,[13] and are much more resistant to radiation and more prone to recur. Wyeth's[14] statement that "an extirpated cancer is the only safe one" certainly applies here, and I believe these should be removed completely by electrocoagulation or the endotherm knife and followed by x-ray or radium.

Squamous Cell. This lesion is highly malignant and often metastasizes early. Here it does not pay to take chances. All mucous membrane malignancies are highly malignant and must be removed thoroughly. The best results are obtained by combined treatment, complete wide removal with the endotherm knife or electrocoagulation followed by filtered x-ray or radium locally. Regardless of the apparent non-involvement, the neighboring lymphatic glands should be irradiated as Eller and Fox [12] advise giving full erythema doses through three millimeters of aluminum every two months for three treatments. In epithelioma of the tongue radon gold seeds properly placed are very valuable. When the glands are definitely involved, the radiologist is far better equipped for handling the case than is the dermatologist. Many deaths from metastasizing skin cancer occur because the surgeon has been too timid or is to attentive to the patient's warning: "Now, I don't want a big scar." Skin grafting has been used for

some time to lessen postoperative scarring. This has recently been brought again to our attention by New and Havens.[15]

Non-Malignant Conditions

Furuncles and Carbuncles. A large per cent of these infections when treated with filtered radiation do not go on to suppuration. In either event the pain is usually relieved in twenty-four to thirty-six hours and if suppuration does ensue, free drainage is usually established within forty-eight hours. Occasionally incision is necessary even after x-ray. Subsequent care should consist of boric acid wet dressings or boric acid ointment. Desjardins[16] has recently recalled this valuable treatment to our attention. Where the infiltration remains heavy after moderate drainage has been established, medical diathermy given to tolerance through parallel block tin electrodes often aids markedly in hastening free drainage. If the carbuncle be a large one and x-ray has not been effective, I prefer to remove the entire lesion with the endotherm knife or by coagulation.

Erysipelas. In this disease it is hard to evaluate any method of treatment because of the clinical course of the infection. I have had no experience with ultraviolet light. Specific antitoxin usually works well but is expensive and I have had a few severe reactions. I now prefer to use x-ray and it is gratifying to often see the temperature drop to normal within thirty-six hours. I use a 9-inch spark gap, 5 ma., 10-inch distance for three to four minutes through three millimeters of aluminum, irradiating well beyond the border of the lesion.

Ringworm. Tinea circinata and tinea cruris can be eradicated by *ultraviolet* radiations from either the mercury vapor quartz lamp or Kromayer lamp by producing an erythema with subsequent desquamation, but a persistent hyperpigmentation remains and other methods are just as efficient.

Ultraviolet and x-ray have both been highly recommended in dermatophytosis of the hands and feet. In my experience the long time result with both has been disappointing although the immediate clinical response is often very good. Other methods in my hands have been far more effective. Dorne and White[47] have just reported a series of thirty cases of superficial ringworm infection treated by *Grenz* rays. They secured good results in those caused by yeast-like fungi, while those of hyphomycetic origin did not respond. In other words, this method runs about as other methods at our disposal. Where there is much itching and burning with more or less weeping and some fissures, ionization, using cotton packs saturated with 2 per cent zinc sulphate solution between and under the toes and the positive pole attached, with the negative pole on the thigh, will markedly, if not completely, relieve all symptoms for two to four days. A current worked up to 6-10 ma. and sustained for 10 to 15 minutes is used. Symptoms may be increased for an hour or so immediately after the treatment. This result is not lasting and the same relief can be given by astringent foot soaks for 20 minutes once or twice a day.

Ringworm of the beard is very stubborn to all treatment. Of the physical agents x-ray is the most valuable. Some cases clear up without producing epilation of the beard. When epilation is necessary extreme caution must be used for the dose which will epilate will usually cause sequlae. MacKee[18] states, however, by using ¼ skin unit every two or three days for four to eight treatments it is possible to produce defluvium without erythema.

Ringworm of the nails is best treated with methods other than physical, although often x-ray works exceedingly well.

Favus and Tinea capitus have been reported responding to ultraviolet irradiation. However, I have had only negative results except in a very superficial type of ringworm (tinea circinata) which happened to localize in the scalp. As the hair shaft or follicle is involved and medicaments will not penetrate to the fungus, epilation is by far the most satisfactory method of treatment. The entire scalp should be epilated or some infected hairs may remain. Of course, this means reinfection of the new hair. Two methods are available. Thallium acetate is dangerous but effective. X-ray if given by the Adamson-Kienboch-MacKee technic is less dangerous and is effective. One skin unit (MacKee) is given at five points of exposure accurately placed. If properly done the hair falls evenly in about sixteen days. Care of the scalp after the epilation dose is given is very important but does not fall within the scope of this paper.

Sycosis. The same treatment is efficacious for this distressing condition as for ringworm of the beard except that not infrequently it

becomes necessary to produce a permanent alopecia. This must be done with extreme care. Shaffer[19] has had very good results in certain cases with ionization. Fox[20] thinks the method very worth while trying in this resistent infection.

Blastomycosis, Sporotrichosis and Actinomycosis. These respond to x-rays but may require systemic measures for a permanent cure.[21] I have tried ionization, driving iodine into the local lesions from the negative pole with little result. This was probably because I did not allow enough time. Shaffer[19] believes that ions pass in the human skin about .3 millimeter only in 15 minutes using two milliamperes of current.

Skin Tuberculosis. Lupus vulgaris lesions respond best to electrocoagulation or surgical excision. Lupus erythematosus, discoid type, responds best to carbon dioxide snow[22] although the Kromayer lamp with pressure gives good results in certain cases; however, this is not without some danger of dissemination. Gold sodium thiosulphate solution intravenously is the most effective treatment but frequently produces severe reactions. Anatomical tubercle is best destroyed by electrodesiccation, although it may be treated by unfiltered x-ray, a cure taking several months. Tuberculosis verrucosa cutis responds well to desiccation. Scrofuloderma responds best to x-rays in full filtered units given each month through three millimeters of aluminum. The same treatment is effective in scrofulous glands. Erythema induratum is best treated by general body upbuilding. General irradiations with the mercury vapor quartz lamp are very helpful. A very high vitamine diet should be given in conjunction.

Warty Nevi. Nevus verrucosus and nevus unius lateralis are probably best treated with electrodesiccation repeated as necessary in the individual case. Care must be exercised to avoid a hypertrophic scar. Occasionally it is best to excise completely with the scalpel or endothermy knife and later reconstructed with a skin graft.

Warts. Verruca vulgaris is speedily destroyed by desiccation. Warts are peculiar actors. At times very light desiccation is all that is necessary while at others the destruction must be extremely thorough. When these occur over the joints, Wise[23] prefers to use x-ray, thus avoiding painful healing areas later. Many warts of the vulgaris type respond beautifully to the x-rays. The lesion is screened closely and a skin unit of unfiltered radiation is given. Thirty to sixty per cent respond in three or four weeks after one single exposure. A second exposure may be made four weeks after the first treatment. If this fails, electrodesiccation should be done.

Verruca plantaris is best treated by x-ray. The thickened, horny layer may be removed by peeling with a scalpel, the lesion then closely screened with lead or lead rubber and a skin unit unfiltered x-ray given. About fifty per cent respond completely and permanently to one exposure. If the lesion does not respond to two such treatments, removal by other means should be resorted to. Electrodesiccation is very satisfactory.

Verruca seborrheica lesions are best removed by electrodesiccation or carbon dioxide snow. If not removed they may give rise to basal cell epitheliomas.[24]

Verruca senilis lesions are best removed by electrodesiccation although x-ray in intensive doses often gives good results. These lesions, when undergoing malignant change, give rise to squamous cell epitheliomata.[24] Scaly nonverrucous senile keratoses may be removed by carbon dioxide snow.

Molluscum Contagiosum and Granuloma Pyogenicum. These lesions are easily destroyed by electrodesiccation or electrocoagulation followed by curettement. Scarring may result if a fine spark is not used.

Hyperhidrosis. X-ray is the only physical therapeutic agent applicable here. One-quarter skin unit through one millimeter aluminum may be given every ten days for five doses. This usually is effective.

Hypertrichosis. Superfluous hairs are best removed by electrolysis. If the needle used is of any metal except platinum, it must be attached to the negative pole; the needle must be properly introduced into the follicle and a current of three-quarter milliamperes to eight milliamperes used. Usually, over four milliamperes gives too much pain and tissue reaction which may be followed by some scarring.

Lately this operation has been done with the d'Arsonval current. The smallest amount of current must be used. The method is reported to be much quicker and as satisfactory. I have had no experience with it but from my observation of three patients on whom it

has been used by other men, I shall continue to use the galvanic current.

X-rays and radium are absolutely contraindicated in hypertrichosis because hyperpigmentation, atrophy, telangiectasis, keratoses and, later, squamous cell epitheliomata are liable to result.

Eczema. It is needless to say here that the cause of the individual case should be sought for and removed if possible. The proper treatment of eczema requires more detective ability on the part of the physician than that of any other disease. In cases associated with intestinal stasis or other dysfunction of metabolism, general irradiations with the mercury vapor quartz lamp or carbon arc lamp prove a valuable aid in treatment.

Chronic indurated patches of eczema (lichen chronicus circumscriptus or neurodermite) usually respond well to hypointensive or semiintensive x-radiation. Ultraviolet light has failed as a rule. Schimanko and Berman[25] found in biopsy specimens 24 hours after vacuum electrode treatment, a marked inflammatory infiltration and many small microscopic necrotic spots throughout the epidermis, and state that this vigorous micro massage has a marked effect in causing involution of hypertrophic lesions.

Acute eczema is usually made worse by ultraviolet light, although occasionally brilliant results are attained. I believe with Smith[26] that these good results are exceptions. Radiant light and heat help dry up oozing patches.

Psoriasis. General ultraviolet irradiation in the guttate type of eruption has often given good results in my hands and has as often failed. Long standing lesions often disappear following blistering doses of ultraviolet light localized to the lesions, on the other hand I have seen wide disseminations follow such treatment. There is probably no therapeutic measure which as often succeeds as x-rays properly given, however they may fail. Long standing lesions may involute after one semiintensive exposure or after a series of fractional irradiations. X-rays should not be used as a routine in all cases of psoriasis.

Acne Vulgaris. I am convinced that too much x-ray is used in the treatment of this very psychologically important and often neglected disease. It is true that x-ray is the most constantly efficient single therapeutic measure. Much preliminary improvement, however, can be evoked by proper hygiene, bowel function, exercise, diet, local applications and ultraviolet irradiations. Not a few cases respond entirely to this régime. Others require fewer subsequent fractional irradiations. The improvement with ultraviolet alone is only temporary in almost all cases.

Herpes Zoster. The pain accompanying and and often following Zoster can often be much lessened by even one or two ultraviolet irradiations. X-ray is often valuable. Likewise, I have had some success with galvanism.

Alopecia Areata. Here again the clinical peculiarities of the disease must be considered in evaluating any method of treatment as probably sixty-five to seventy-five per cent will entirely recover without any treatment.[27] Blistering doses of ultraviolet light apparently works well in some cases. Irritation from vacuum electrode sparks may be effective.

Rosacea. Unfiltered x-ray in quarter skin units is often effective where pustulation is marked, but should not be used as a routine. The telangiectatic vessels can be easily destroyed by electrolysis with no scarring.

Keloids and Hypertrophic Scars. These respond best to x-ray or radium with proper filtration. Very thick keloids are best removed surgically (scalpel or endothermy) and at the first indication of reformation of the keloid, x-ray should be given. The rays given immediately after surgical removal will not prevent keloids; however, if given when the new fibrous tissue is beginning to develop they are effective.

Pruritis Ani et Vulvae. The etiologic factor must be sought for and eliminated if possible. Proctitis, rectal polyps, anal fissures, local dermatophytosis, etc., if present, must be properly treated. In "essential" pruritis, Oliver[28] has secured excellent results by ionization, using 1 per cent zinc sulphate solution or 1 per cent solution of iodin. Pusey (discussing Oliver's paper) believes the itching is due to chemical irritation of fecal matter and concludes that cleanliness is the most important factor in proper treatment. X-ray in fractional doses relieves most of these cases at least temporarily, although the condition tends to recur.

Nevus Pigmentosus. These lesions do not respond well to x-ray or radium except in massive doses. It should not be used. Hairy moles, regardless of color, can be removed by electrodesiccation or carbon dioxide snow.

Frequently, if the hairs are removed by electrolysis, the pigmentation will disappear. Brown moles may be removed. Slate colored, blue, blue black or black moles, unless subject to irritation or showing enlargement, should be left alone. Otherwise they should be removed widely and deeply with the endotherm knife or by electrocoagulation, first sealing off the blood vessels and lymph vessels one-half to one inch beyond the border of the pigmentation. It is safer to remove also to the depth of the facia and not stop then if examination of the under surface of the removed section shows any pigmented granules at all.

Birth Marks. 1. Angioma Cavernosum. The deep vessels, especially the veins, are here involved. They not infrequently become infected or undergo spontaneous involution producing marked scarring. Radium is the treatment of choice. A full strength application using .1 mm. of aluminum filter produces excellent results. Suberythema doses are given at monthly intervals. Even first degree reactions shou'd be avoided.[29] Small lesions are best treated with *beta* radiation although they also respond well to carbon dioxide snow, or x-ray through 3 mm. aluminum. Eller[22] reports good results in some cases with biterminal endothermy.

2. Nevus Vasculosus. Radium is by far the treatment of choice with carbon dioxide snow second.

3. Nevus Flammeus (Port wine mark). X-ray and radium are contraindicated. Good results have been reported with the Kromayer lamp and pressure. As a rule, however, carbon dioxide snow gives the best results, although MacKee[27] expects 75 per cent improvement in three years time.

4. Nevus auraneus (stellary nevus or spider nevus). This lesion is curable in one treatment by destroying the central dilated vein with electrolysis, electrodesiccation or electrocoagulation. No scarring results if properly done.

Callositas. Painful callouses of the soles may be treated effectively as recommended for verruca plantaris. Subintensive doses through 3 mm. aluminum must be given.

Summary

1. Physical therapeutic measures have been found valuable in many dermatologic conditions.

2. The most common dermatologic diseases in which physical therapy has been used by the writer were listed.

3. Where methods other than physical are most effective, no attempt was made to outline these methods.

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Discussion

Dr. Lynne B. Greene (Kansas City, Mo.): I am sure we all enjoyed this paper, for it has been presented from the standpoint of conservatism in the use of physical therapy. He has covered the field very thoroughly for the reason that much has been done for the skin throughout the history of mankind, because the skin has been so handy for man to experiment. Everything has apparently first been tried on the skin. Next to the liver, I think the skin is the most maligned organ in the body.

The essayist spoke of classification of dermatologic conditions. We have to admit that dermatology has changed wonderfully in the last few years, particularly in the list of local lesions. This is the reason why eczema has fallen into disrepute as a name, simply because we have taken so much away from eczema that there is very little eczema left.

This accounts for some of the results obtained in the use of physical therapy and in other local treatment. All physical agents should be looked upon the same as any other local application we are about to choose in the treating of any skin condition. We should know the skin in the first place; we should know and recognize it as an organ of the body. We should know, then, in order to properly use physical therapy, the physical possibilities in the agent. It is impossible to know everything about dermatology and it is also impossible to know everything about physical agents. We are still in our infancy as regards the future possibilities of physical therapy, but we do know a great many things that are certain, and Dr. Wilson has very ably presented them.

When you are treating the skin remember that it is an essential organ of the body. We know that a disease or an accident affecting a surface equal to two-fifths of the entire area of the skin means death. It is just in proportion to the amount destroyed that results may be anticipated. I wish to highly applaud the conservative attitude of the speaker.

Dr. J. A. Borghoff (Omaha, Nebr.): I think that the paper is entitled to rather a free discussion. Certainly Dr. Wilson has covered a big field in a short time, and certainly in an admirable way.

I do not see how we can continue to consider the treatment of dermatoses as being in its infancy when we consider the advances that have been made, perhaps due to physiotherapists in the past eight to ten years. I think, rather, we should feel that due to the work, perhaps, of Dr. Wilson and a great many other men, dermatology has gone on rather into puberty. In other words, we are about mid-way where we would like to arrive. I make that statement knowing full well the number of instances of lack of good result.

I would like to corroborate Dr. Wilson's statement regarding the treatment of dermatophytosis, or this so-called athlete's foot, if you will.

The use here of ultraviolet light has given us very little. Ultraviolet light is a stimulant and it is a healing agent. In order for a fungus to grow we require heat, and that stimulating agent as we know produces sweat. After all, it is nothing but sunlight. It stimulates the skin. Anything that stimulates skin, stimulates oil and stimulates sweat. Sweat and the heat incidental to that treatment, or the erythema incidental to the treatment, give us the proper field for the growth of that fungus. Consequently ultraviolet light, it would seem to me, is contraindicated.

X-ray has much the opposite effect in this same condition. It is an inhibiting agent. It inhibits the amount of secretion. It isn't heating unless given in rather massive dosage. Consequently it should and most frequently does give us the result that we seek; at least relief, even if it is only temporary.

One more example: Lupus erythematosus has in the past been treated rather freely with the Kromayer lamp, and with ultraviolet light. That is out entirely. The ultraviolet light, it is proven, will stimulate the dissemination of the disease and give instances in which individuals who have not had lupus erythematosus, following a severe sunburn, will develop lupus erythematosus around the site in which this individual has been sunburned. Consequently we should throw that out. X-ray is of little less value and perhaps the better remedy is the use of CO_2 snow.

Dr. Wilson should be congratulated on covering such a big field in such a short time, and capably.

Dr. Ross (Omaha, Nebr.): The second speaker stated that if two-fifths of the skin surface of the body was destroyed the patient invariably died.

Thirty-five years ago I had a case of a boy of eighteen falling into a lard vat at South Omaha. He was burned entirely excepting just above his

armpits. He threw out his arms and prevented his going clear in. I think that if anywhere near two-fifths of the skin is destroyed ordinarily it is due to absorption, to pus formation, and the patient necessarily does not need to die if the proper treatment is instituted.

Dr. Donald J. Wilson (Omaha, Nebr.), closing discussion: I want to call attention to the fact that this is a tremendously big field to try to cover in twenty minutes. It cannot be done. You have to leave out a certain amount of detail, and you as individuals are probably interested in some of them.

I want to make a plea now, the same as I made in the first part of my paper, for one thing, and that is proper diagnosis. It was stated a while ago that pioneering is needed. That is true. Pioneering is needed. But we must also have the proper diagnosis in order to make that pioneering of any benefit, not only to ourselves but to others.

We seem to have gotten off on the subject of athlete's foot just a little bit, and in view of the fact that we have, I want to give you here a little experience which I have had during the last two weeks. I had the privilege of examining 88 university boys. Of the 88 university boys, three showed no clinical signs of dermatophytosis — three out of 88. Out of the 88, 25 per cent had no idea at all that they had anything wrong with their toes. So it shows somewhat that this is a very important subject, and I think it is worth considering as to whether or not we should treat it with ultraviolet light or with x-ray or with something else. Please, when you people go home, don't call it all eczema of the feet. (Applause.)

BONE CYSTS *

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My personal experience with bone tumors is limited, but the recent Pathological and Radiological Conferences given by Dr. J. C. Bloodgood at the Johns Hopkins University, together with intensive study of literature, has been of much value in the preparation of this paper. I am also indebted to Doctors R. W. Fouts and A. F. Tyler for radiograms of selected cases used in the preparation of the lantern slides.

A great deal of research on bone tumors has been done within the last twenty-five years. Bloodgood states in the *Journal of the A. M. A.*, October 15, 1904, that he had observed but three cases of bone cysts of the long pipe bones, in the surgical clinics of Johns Hopkins University up to that time. The interpretation of the pathology of bone tumors is a subject much discussed in recent years and considerable investigation is being done by way of comparison of the microscopic findings of the tissues removed and the shadows shown by radiograms. The clinical history must also be observed for all available data is necessary for a diagnosis.

The varieties of tumors of the bone are not great if one considers the composing structure, i.e., fibrous tissue, cartilage and bone. There is another group of tumors, not osteogenetic in type, which invade the marrow, vessels, and overlying fibrous tissue. Dr. Geschickter has divided tumors of the bone into two groups, those related to osteogenesis and those of non-osseous formation.

Etiology

The etiology of bone cysts is not known. Some authors lean to the theory of inflammation, some to trauma, and others attribute it to a resorptive stage during growth when calcified cartilage is replaced by permanent bone, as is characterized by giant cell formation accompanying the steps of development necessary to reach the adult stage. There are three tumors related to subsequent cartilagenous growth: (1) the benign giant cell tumor, (2) the osteolytic-osteogenic sarcoma, and (3) the bone cyst. The bone cyst is in reality a pseudo cyst as it has no endothelial lining. They are generally seen in adults in the active growing stage, the majority occurring between the ages of 10 and 17.

Symptoms

Symptoms are very different according to whether there is or is not a fracture. In some instances, there may be a vague rheumatoid pain, never violent, occurring in the

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long bones without any apparent reason or after a slight contusion. In other cases, there is expansion without pain. In central sarcoma, multiple myeloma, and metastatic carcinoma, pain and tenderness are more frequently observed than in the bone cysts or the central giant cell tumors. Loss of function is not present except in fracture or when the cyst is the joint. The skin is normal and there is no increased local circulation. There is no thickening of the integuments and they are not adherent to the deeper structures. The tumor is hard, uniform in consistency, without any thickening of the periosteum. When bone tumors are found and are subsequently re-examined by the x-ray for further progress, he same technic should be used in order that lefinite roentgenological comparison can be made.

Pathology

Grossly, the bone appears to be expanded in all dimensions, except in very small cysts. The periosteum is intact unless a fracture has occurred. The walls present a thin cortex. There may or may not be a fibrous lining. The cyst may be filled with either fluid or fibrous tissue, or both. The most common locations are the upper humerus, upper femur and upper tibia, although cysts have been found in practically all parts of the skeletal structure. If the x-ray shows an expanded, intact bone shell, the surrounding soft parts feeling normal, and the tumor being filled with fluid, there should be no difficulty in making the diagnosis, particularly if the patient is under 15. In cysts filled with dense fibrous tissue, pathologists have mistakenly diagnosed sarcoma. The radiogram of a bone cyst cannot be regarded as characteristic. It is true the location of the lesion is helpful. The cyst rarely extends into the epiphysis or through the epiphyseal line, while the giant cell tumor and central sarcoma usually do. There are exceptions to both. Up to the present time there is no proven way of making a diagnosis from the x-ray. The x-ray usually shows a symmetrical bone expansion, and there may be lines of trabeculation, or a fracture.

When the x-ray of a central bone tumor shows an intact bone shell, and one can palpate a definite tumor or a definite infiltration in the soft parts outside the shell, then other pathology is present, either a sarcoma, an infected bone cyst, tuberculosis or a Brodie's abscess. The smoothness of the bone shell shadow argues against tuberculosis, but there is nothing in cysts of the acetabular cavity that would allow a differentation between a cyst, giant cell tumor, chondroma, and a myxoma. In adults, the most common central tumor with intact bone shell, with or without fracture, is the giant cell tumor, the next most common being the unhealed or latent bone cyst, then the chondroma or myeloma. The most rare are the central sarcoma, metastatic carcinoma, and the multiple myeloma.

Biopsy of a cyst will show no change in the soft parts while cutting down upon the tumor. In stripping back the periosteum, the bone is dark in color and on removing a portion of the shell, there exudes a viscid fluid, not under pressure. The fluid may be slightly brown and contain some blood if a recent fracture has occurred. On curetting the shell, there is no endothelium and there may or may not be a fibrous tissue lining. Occasionally there is some red granulation tissue which closely resembles a giant cell tumor, and microscopically does contain some giant cells. This differs in appearance from a myxoma which is composed of a tapioca-like substance. With the exception of solid ostitis fibrosa, there should be no trouble in recognizing the different types of benign cysts when the bone shell is removed.

A demonstration in the x-ray of multiple central lesions excludes primary sarcoma. The patient with multiple myeloma, as metastatic hypernephroma, as a rule has Bence-Jones bodies in the urine in adults and the patient shows cachexia. In metastatic carcinoma of adults, there is usually a history of a primary tumor elsewhere. In young individuals, the multiple central tumors have proven to be chondromas and not cysts. Bloodgood states that when the patient is under 15, one may be quite certain it is a bone cyst. When the epiphysis is involved, it is usually a giant cell tumor. If the patient is an adult, one must bear in mind the rarer chondroma, myxoma, metastatic tumor, multiple myeloma and sarcoma.

Exploratory operation may be necessary, particularly if the patient is over 15 years of age.

Treatment

When the patient is under 15, one is justified in delaying treatment. If there is a fracture, it should be treated as any other frac-

ture. If no fracture, the limb should be supported by splints to prevent it. If the x-ray shows no further expansion, and there is some ossification, a spontaneous recovery usually occurs. If there is any doubt of diagnosis and there is evidence of further expansion without ossification, the lesion should be explored, especially if the patient is older than 15 years.

Summary

1. With correct diagnosis of bone cysts, there will be fewer operations and better results. Clinical history, physical examination and x-ray are essential in practically all diagnoses.

2. The most frequent site of bone cysts is in the upper parts of the humerus, femur, and tibia.

3. Fracture is sometimes the first symptom.

4. A biopsy is justified after the age of 15 with protracted symptoms.

5. From the study of literature, it has been especially noted that good pathologists and roentgenologists have many times changed their diagnoses subsequent to review of the tissue, radiograms and clinical results.

Discussion

Dr. R. W. Fouts (Omaha, Nebraska): Although I was late in hearing the first few pages of the doctor's paper, he was good enough to conform to the rule laid down by the Congress to send a copy of his paper to the respective discussors ten days prior to the meeting. I therefore had an opportunity of reading his paper and I appreciate the amount of work necessary to review the literature in order to round out this type of paper.

There is one other thing for which I want to express my appreciation. He remarked at the end of his discussion that a good radiologist may sometimes make a mistake in diagnosis, and to that end I want to plead guilty.

To discuss the last case in question, the one illustrating the bone cyst of the upper end of the femur: As stated by Dr. Hustead, perhaps the thing that entered into consideration in arriving at this conclusion (if I may see the picture again, please), was the history of the case. The case was operated by a competent surgeon, Dr. B. B. Davis, well-known in Omaha and in this section of the country, who amputated the breast and proved its pathologic nature by post-operative biopsy. If there should be any question as to the diagnosis of the original tumor, the fact that it occurred proves beyond doubt that it was malignant. Three years following this, as the doctor stated, she developed rheumatoid pains. An osteopath treating her for rheumatism heard something snap during the treatment which produced great pain. A few days later we saw her and obtained the above history of the breast carcinoma, as you will note from this lantern slide, following this fracture. You can't see it up close, but I would defy almost anyone to take my original plate and make a different diagnosis, bearing in mind the fact that carcinoma of the breast so frequently metastasizes to the hip at that point. Consequently we made the diagnosis of metastatic carcinoma of the hip, and her surgeon advised amputation. The Lord was with the patient when she refused to give her consent. She went home. I heard no more from that patient for about fifteen months, and one day a lady came to my office from another side of this city and introduced herself as a sister of Mrs. So-and-so whom I had x-rayed some years ago. Not wanting to revive sad memories, I nonchalantly asked: "How is she getting along?" Certain that her answer would tell me when she had gone to that bourne from which travelers do not return.

"Very well," she replied. "She is walking a with a little limp, but she is feeling fine."

I was astonished but managed to hide it by remarking: "I wish you would ask her to come and see me. I should like to see her and get another picture."

To my surprise, two days later, the woman in question walked into my office with a slight limp, weighing between 170 and 200 pounds. The result of the healed fracture as shown on the next picture was obtained, proving beyond question of doubt that, unwittingly, the manipulation for her rheumatism was the treatment she needed for bone cyst, which we had diagnosed metastatic carcinoma and advised amputation. At that time we could not say, looking at that picture, that this growth did not itself perhaps destroy the cortex, the thing a bone cyst does not do except in a case of fracture. Looking back we can see a plain bone cyst and yet that location is a very infrequent one. We acknowledge the mistake.

The treatment of bone cysts, which the doctor has touched upon is just what happened here. It is either a spontaneous fracture or surgical intervention that results in a fracture, or at least a partial fracture, a crushing of part of the bone which is permitted to heal. They are rather innocent things until they approach the point of complete destruction of the shaft of the bone and hence do not attract much attention. If they occur near the end of the bone they are usually regarded as rheumatic or something of that nature.

Dr. Charles L. Hustead (Falls City, Nebraska) closing discussion: There is nothing else to add to what has already been said, Mr. President, except that latent bone cysts consist of about twenty per cent of all bone cysts. It is not an indication of the active process continuing but simply a failure of nature to collapse the cavity that is surrounded by a harder bone shell. Those cases differ in no respect from the cysts found in adults.

USES OF ULTRAVIOLET IN THE NOSE, PHARYNX AND LARYNX *

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Ever since ancient times, more or less attention has been given to the influence of sunlight upon disease. It has been only in recent years, however, that definite knowledge has been obtained regarding the curative effect of sunlight. It was the work of Finsen that really established ultraviolet therapy on a scientific basis. Finsen succeeded in demonstrating the effectiveness of the short wave lengths in the visible spectrum, and the shorter waves that are beyond human perception. He established them as a photo-chemical therapeutic agent with positive bactericidal, photosynthetic and reconstructive powers. The rays at the short end of the spectrum, the violet, and beyond them, the ultraviolet, were definitely shown to possess therapeutic qualities. It was also discovered about this time that these short rays were not conducted by glass but that they were transmitted by fused quartz crystals.

These discoveries made possible the manufacture of apparatus whereby artificial sunlight can now be applied as desired. Ultraviolet is now available for use by two types of lamps, the air cooled and the water cooled mercury in quartz. The air cooled lamp gives ultraviolet rays ranging from 2000 to 4200 A. U., with a preponderance of the longer waves. The water cooled lamp generates the shorter ultraviolet rays approximately from 2000 to 3000 A. U., with a preponderance of the shorter rays. The air cooled lamp is used for general body irradiations, while the water cooled lamp is used mostly for short range and contact application and into cavities. It was not until Kromayer devised the lamp which bears his name that the water cooled ultraviolet lamp was available for eye, ear, nose and throat work.

Broadly speaking, the indications for ultraviolet in nose and throat work is in infections. The tubercle bacillus and the diplococcus are the most susceptible to ultraviolet rays.

The specific action of ultraviolet light is: (1) Bactericidal; (2) Breaks down toxins; (3) Increases the red cells and hemoglobin; (4) Reduces white cell count; (5) Relieves congestion; (6) Hastens elimination of waste products and (7) Stimulates metabolic processes. The most important of these from our standpoint is the bactericidal action.

Such nasal infections as chronic rhinitis and hyperesthetic rhinitis are greatly benefitted by the use of ultraviolet in conjunction with other remedies. In hyperesthetic rhinitis, general ultraviolet irradiations should be combined with the administration of calcium and thyroid.

Chronic rhinitis which accompanies some of the low grade ethmoid infections, is greatly relieved by the use of the water cooled ultraviolet. The mucous membrane is stimulated, the engorgement of the tissues is reduced and the secretion lessened.

Following nasal operations, especially those in which the ethmoids have been curetted, ultraviolet is of great help in preventing turgescence and keeping granulation tissue from forming.

The nasal mucous membranes are much less sensitive to ultraviolet than those in the throat. The nose may be exposed for as long as twenty to thirty minutes after a tolerance has been established. The usual length of time for throat irradiation runs from thirty seconds to two minutes.

As nearly as possible, the nose should be cleansed of all secretions and exudates and all crusts or scabs removed before using ultraviolet as the rays have very little penetrating power — only about 1/32 of an inch.

Ozena has shown a marked improvement with ultraviolet treatment in conjunction with the high frequency glass electrode spark. After cleansing the nose of all crusts and exudate, the high frequency effluve is used on the mucous membranes. Following this, ultraviolet is used. After a few treatments, the membranes will stand exposure as long as twenty to thirty minutes. These cases can be kept very comfortable with occasional

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treatments, although I have never seen a permanent cure from it.

Vincent's Angina is sometimes very stubborn and resistant to treatment. Many remedies have been used for its cure, but none of them is successful in all cases. However, the use of ultraviolet comes nearer to being a specific for Vincent's Angina than any other treatment. Thirty second exposures are used. However, I always follow this treatment with some other form of medication.

Acute tonsilitis, if seen early, is greatly benefitted by the use of ultraviolet. The usual duration of the disease is cut down about one-half and the constitutional symptoms are much less severe.

Subacute and chronic pharyngitis respond rapidly to the use of ultraviolet. Shillito of London[1] sprays the pharynx with a weak solution of silver nitrate and then uses the ultraviolet for sixty seconds. He feels this is more efficient than using the ultraviolet alone.

Tuberculous ulcers of the pharynx and larynx have responded readily to the use of ultraviolet as the tubercle bacillus is easily killed by this method. Exposures of from one to two minutes are used. Weisblum[2] reports great success with this method of treating tuberculosis of the pharynx and larynx. In treating the larynx, he cautions that all chances of malignancy should be ruled out first, as the use of ultraviolet will stimulate the growth of cancerous tissue.

Acute laryngitis responds well to the use of ultraviolet rays applied for about one minute. I have not found it to be of any value in chronic cases of laryngitis.

Diphtheria carriers may be sterilized by the use of ultraviolet irradiation. Donnelly[3] reports 100 per cent success in rendering diphtheria carriers free from infection.

Conclusion

1. Ultraviolet is of distinct value in all types of nasal and throat infections.
2. It is especially effective for tubercle bacilli.
3. In most instances, the water cooled lamp should be supplemented by general irradiation.

References

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Discussion

Dr. A. R. Hollender (Chicago): I am in a rather strict agreement with the essayist that ultraviolet has more limitations than indications so far as the nose, pharynx and larynx are concerned. I mentioned this morning that I was not as enthusiastic about the use of ultraviolet in the nose today as I was some years ago. I do not believe that any of us who are using it to any large extent is as enthusiastic now as in the beginning of our experience.

The indications for ultraviolet were well outlined and there is no need of going into that subject again. I thought that I was one of the first ones to use a weak solution of silver before irradiation with ultraviolet in the pharynx, and particularly in ulcerations and in Vincent's angina. Like anything else, after you spend your time devising a scheme of treatment you find that somebody else devised it thirty-five years before and then discarded it.

The idea of using silver on mucous membranes was suggested to me because of the reports that have been found in the literature on the treatment of ringworm. I think one of the most effective remedies, curatively, for ringworm is painting the ringworm with a weak solution of silver nitrate, and then irradiating it with ultraviolet. In a great many conditions where silver in itself or ultraviolet in itself will not produce good conditions, the combination of the two do produce some effective results.

I was rather disappointed at an omission in Dr. Wahrer's paper rather than a commission. Certainly, on the use of ultraviolet in the larynx we ought to hear a great deal more than Dr. Wahrer mentioned.

There is one instance where ultraviolet will produce beneficial effects, providing, of course, other factors are equal. If you treat a patient with a greatly involved lung and who has a complicated laryngitis, a cure of the laryngitis will not do him any good. But all things being equal, and with a fair chance, ultraviolet is one of the most effective remedies that we have for tuberculous laryngitis. I don't believe there is any question about it.

Therefore the local treatment must be supplemented with the general treatment, as emphasized by Dr. Wahrer. Probably Dr. Wahrer in referring to ulcerations in the pharynx and larynx had in mind the fact I was to say a word about this one thing. What refers to ulcerations generally, of course, would be referable to these tuberculous ulcerations in the larynx. I do not want to go into the details of that subject. It is a big problem in itself. A great deal of work is being done on that one subject now in practically every large institution in which the tubeculous are being treated.

Dr. A. T. Rasmussen (La Crosse, Wisconsin): Dr. Wahrer mentioned the 30-second exposure in the treatment of Vincent's disease and angina. I am somewhat at a loss, because of some studies

I have made in the matter of dosage, as to just what that means. I have had in my office at the same time two generators, made by the same manufacturer, identically alike so far as external appearance was concerned. Everything else being equal, there would be, as nearly as I could figure it out, a difference in efficiency of about 50 per cent. On the other hand, I have applicators in my office, and, everything else being equal, one is probably a third as efficient as the other.

With the generator that I am using and the applicator that I am using as a standard, I should dislike very much to have anyone give me over a 10-second exposure, operating at, say, 75 volts. I mean on any of the mucous membranes of the mouth. I would not have anything above the ten-second exposure with my particular generator or my applicator. I am afraid I would be giving such a severe treatment that there would be severe sloughing. I have always made it a point in attempting to say anything about dosage to qualify that by a statement as to the effect that you get, based on the efficiency of the generator and applicator.

I wonder what the Doctor's experience has been in that.

The combination of nitrate of silver and ultraviolet rays strikes home rather forcibly with me. Like Dr. Hollender, I just patted myself on the back, thinking I had found out something. I used it first in other ways and then I wondered what happened. What happens, of course, is that the precipitation of metallic silver within the structures themselves wherein the nitrate of silver has penetrated, comes out through the action of the rays. The nitrate of silver, being a photosensitive chemical, precipitates out, just as in all photographic processes. The metallic silver itself is highly bactericidal. I wonder if that is not what is actually taking place in the use of the combination of the two. That at least is the thing that I thought of.

Dr. A. R. Hollender (Chicago): I want to add one point to my discussion. This is with reference to dosage. We have gone over this thing so many times in the past, all the way back to three or four meetings, that I assumed that everybody understands the matter of relative dosage so far as the pharynx and the nose is concerned.

The ratio of the tolerance of the membranes in the nose, as compared with the tolerance of those of the pharynx and in the mouth, is about one to ten. If some area in the mouth will tolerate ten seconds without too severe erythema, it will take about ten times that amount to produce any kind of appreciable reaction in the nose.

Why that is, I don't know. At first we thought that the mucous covering the nasal mucous membrane was responsible, that the rays won't penetrate it. Then we used various cleansing agents, from water, salines, and so on, down to soda solutions and what not. We attempted to cleanse the nasal mucous membrane as thoroughly as possible. Then we irradiated and found the same thing to be true. In fact, Dr. Wahrer and I were discussing this problem today. He has been able to do it, I have been able to do it, and others have been able to irradiate the nasal mucous membranes for twenty or thirty minutes with a quartz rod and not get any severe reaction. It is a question of just how much reaction of any kind you get. You probably do get a reaction at the tip of the rod. Whether it is due to the fact that these rays are not given off with sufficient intensity from the sides of the rod to produce any appreciable effect, or whether it is due to some other cause, I don't know. I regret to say that I have unsold myself on the idea of getting some kind of appreciable reaction in the nose from ultraviolet as we have been in the habit of using it. What this cold quartz is going to do I am not in a position to say at this time because I haven't used it sufficiently. That has been my experience so far as the ratio of effect between the pharyngeal and nasal membranes is concerned.

Dr. Joseph Mindess (Winnipeg, Canada): I can't let this occasion pass without making or asking some questions with the intention of clarifying certain statements made by the different speakers. I have been very enthusiastic over physiotherapy treatments and I have read every bit of literature that I could obtain. I have come all the way from Canada to see what I could find here in the form of knowledge. To my mind the new ideas of physical therapy are very much exaggerated. As Dr. Hollender expressed himself when I saw him personally in his office, "Don't become over-enthusiastic."

We often recommend physical therapy, especially ultraviolet, in local and systemic diseases. Dr. Wahrer happened to mention its indication in pharyngitis, and although I am not an otolaryngologist, so far as the application of ultraviolet in chronic pharyngitis is concerned, I fail to see how ultraviolet applications would be of any help in it, because chronic pharyngitis is usually a manifestation of a chronic systemic disease, usually associated with chronic gastroenteritis. We usually meet with such conditions in chronic drinkers and those who are susceptible to gout, those who have a low vitality or whose health is below par.

Would the essayist kindly inform or enlighten me as to how ultraviolet could be of any benefit at all in chronic pharyngitis, which is a manifestation of system disease?

Dr. F. L. Wahrer (Marshalltown, Iowa) closing discussion: Dr. Hollender said he was a little disappointed in some of my omissions in not going into more detail in regard to the application of ultraviolet in tuberculosis of the larynx.

I stated, of course, very definitely that it was one of the real benefits that was received, and I purposely said no more for two reasons. One is because personally I have had almost no opportunity of treating cases of this type myself, but I knew that Dr. Hollender had had a great deal of experience in it. I knew he would be here and I had laid my plans to see to it that he made some mention concerning that, in order that you would get some first-hand information from a

man who has had a great deal of experience with it.

I feel that the use of ultraviolet in most nose and throat conditions is merely an adjunct. I feel that it is helpful, but I also feel that if I had to I could get along very nicely without it in most of these conditions. I feel that it is not a necessity, so far as I am concerned, although I do use it and I feel that it is helpful. In some cases which prove a little bit stubborn to ordinary methods of treatment, ultraviolet will help me to get my results.

As Dr. Hollender has said the most definite and worth-while use of ultraviolet is in tuberculosis of the larynx and some of the ulcers of the pharynx and tongue.

In regard to what Dr. Rasmussen said about dosage, he is right about that, to this extent: When we get to talking about ultraviolet exposure, it depends a great deal upon the ultraviolet lamp you are using and upon the quartz rod that you are using. They will vary in different situations. When you might get a reaction of the proper intensity in ten seconds by using one type, when you use another lamp or another quartz rod it may be twenty or thirty seconds or one minute.

I believe, however, that with most applicators, most machines, you won't get any very violent reaction with a 30-second exposure. In fact, some of our mouth treatments can be irradiated up to two minutes very easily. That is, of course, after a tolerance has been established.

In regard to what Dr. Mindess said concerning chronic pharyngitis, I question if his statement, that it is always a manifestation of a chronic systemic disease is true. I don't believe that, Doctor. It is true that chronic pharyngitis is probably not a disease which is an entity without a systemic background; it is a secondary reaction of something else.

It is true that foci's should be cleaned up. A man can have a chronic pharyngitis from excessive smoking. You have him cut out the smoking, but it would take him some years perhaps before the mucous membrane returns to normal. It is our duty after removing the primary cause to then go ahead and do something for this mucous membrane to help it return to a normal state. It is just the same when a man does a resection on the nose and in ten days the incision is healed. You can't send the patient on his way rejoicing, thinking that that is all there is to it. Any man who does that is negligent in his practice. He must go ahead and treat that nose afterward and endeavor to do the really important thing, which is to restore the mucous membrane of the nose as nearly as possible to a normally functioning structure.

We will take it for granted that where a man has a chronic pharyngitis you will endeavor to clean up the primary cause first, but that does not excuse you from further trying to clean up the chronic pharyngitis that has resulted from it.

ELECTROSURGERY IN NEOPLASTIC CONDITIONS *

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Inasmuch as the scope of this paper is limited to the use of surgical diathermy in neoplastic conditions, it is deemed advisable to preface the discussion with the statement that the author does not advocate the use of this one agency to the exclusion of other proven aids in our attack upon malignant or potentially malignant growths. In the present absence of any known specific he advocates and uses, upon proper indications, any agent, be it chemical, biologic, physical, or purely surgical, which the experience of himself or others indicates that it may contribute to the comfort of the patient or give hope for ultimate recovery. By this he does not mean a haphazard shot-gun method of attack, but a logically planned defensive, based upon a study of the individual patient, knowledge of the nature, location, and extent of the growth, the grade of malignancy to be dealt with, and its susceptibility to radiation, thermocoagulation, and surgical extirpation. As physicians and surgeons we should use a correlated therapy based upon a broad perspective.

Before any definite line of treatment of a suspected malignancy is instituted, a biopsy specimen should be taken, preferably removed by the loop electrode, with a slow cutting widely coagulating current, and should be examined microscopically for determination of diagnosis and grade of malignancy. If found to be a type that yields favorably to x-ray radiation, and there is no particular urgency, radiation may be advocated. Post-operative radiation of the operative site and regional lymph nodes is believed to be an essential additional precaution. Justification for radiation is found in the rationale for same set forth by Swanberg, Boot, and others in recent papers on the subject. The former concisely states that the local effect is evidenced by swelling and vacuolization of cell protoplasm and nuclear shrinking followed by an inflammatory reaction with phagocytosis and absorption, and connective tissue replacement. Boot states, "It is known that radium and x-ray cause sealing of the lymphatics and closure of blood vessels from swelling of their endothelial lining, and that this may be sufficient to stop the spread of the growth temporarily, but the original cells are apt not to be destroyed unless the whole structure is destroyed by a burn." This latter effect, of course, is to be avoided when radiation is used in conjunction with surgical diathermy, either preoperatively or post-operatively. Used preoperatively it is desirable to secure a partial lymphatic and circulatory occlusion which might help in preventing dissemination through the manipulative trauma incident to even the most gentle electrosurgical procedures.

Surgical diathermy is an inclusive term arising out of a regrettably redundant nomenclature developed in association with the surgical use of diathermy. It covers such methods of technic as have been described as electrosurgery, electrocoagulation, electrodesiccation, endothermic surgery, fulguration, etc. A great impetus has been given to this phase of surgery within the last few years, but in spite of an extensive and rapidly growing literature, considerable misunderstanding and confusion still exists as to its utility and technic, especially among those who use it only occasionally. This situation is taken as a justification even at the risk of being somewhat pedantic and repetitious, for prefacing the discussion concerning technic with a few well known statements concerning fundamentals.

Diathermy is endogenous tissue heat developed through resistance offered by such tissues to the passage of a high frequency current that may be made to vary greatly as to voltage, amperage, and frequency or type of oscillation, and thus produce a variety of effects, according to the knowledge

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and skill of the operator. This conversion of electrical into caloric energy can be regulated to produce beneficial physiological tissue changes known as medical diathermy, or to produce those certain oscillatory and thermic effects which cut tissues, desiccate, char, or coagulate them and therefore designated as surgical diathermy.

It is not surprising that malignant growths claimed the first utilization of surgical diathermy, as this form of electrical energy lends itself admirably to their destruction when accessible and not too far advanced. Its possibilities were early recognized and used in France by d'Arsonval, who first developed the diathermy current, and by Riviére, a contemporary, who demonstrated its destructive effects before the Congress of Electrology and Radiology at Paris, in 1900. Distinct improvement was reported in treatment of carcinoma subjected to fulguration or sparking from high frequency apparatus. Nagelschmidt, of Berlin, an appreciative follower of the researches of d'Arsonval, improved upon the high frequency apparatus of the latter, and was only second to Doyen to demonstrate electrocoagulation as a surgical procedure. The term "electrocoagulation" was coined by Doyen and adopted by the profession. Of the American pioneers, Pfahler and Clark of Philadelphia are foremost authorities, the latter, through his extensive researches and clinical experience with uniterminal high frequency technic brought to the fore the value of electrodesiccation, a term credited to his coinage. Disraeli Kobak, of Chicago, is another authority of note. In addition to these there are other distinguished operators of whom limited space does not permit mention.

A further added impetus has been given to surgical diathermy by the recent perfections made in high frequency apparatus and in the cutting current, and out of this has arisen an abundant literature on the subject. The ease with which these instruments may be manipulated has led to its altogether too frequent use by inexperienced hands. During the several years that the writer has served as director of the physical therapy department of a large general hospital, which period was preceded by one of combined surgical and physical therapeutic practice, he has had an excellent opportunity to observe, in one way or another, the surgical diathermy technic of numerous operators. His official capacity with the hospital gives him opportunity to participate in or to observe practically every surgical diathermy operation. Up to the time of the perfection of the cutting current the results were consistent with thoroughness of the operator, as usually only experienced operators used surgical diathermy for its coagulation effect.

With the development of the so-called radio knife, which incorporates a sustained high frequency current of intense tissue disintegration and properties with minimum of coagulation, numerous scalpel-minded operators took up its use in malignancies with results that have often been to the disadvantage of the patient and to the ultimate repute of a heretofore beneficial and respected procedure. I refer to what I believe is the improper and too extensive use of the cutting current by scalpel-minded operators, most of them appallingly ignorant of high frequency generators but determined upon speed and cosmetic anatomical restitution. Somehow they have read or heard that surgical diathermy gives the nearest approach to the ideal method for the removal of malignancies through its ability to coagulate tissue and malignant cells, seal off blood capillaries and lymph channels, thereby reducing transplantation and metastasis to the minimum. They have also heard that wide margins required in scalpel surgery are not required in diathermy surgery.

Consequently, in attacking, for instance, a malignancy of the urinary bladder, approached suprapubically, they remind one accustomed to more conservative methods, of a prize-fighter who is determined to get in the first blow and to strike hard. Being of scalpel hand and mind and determined to excise, they should do it, where anatomically possible, after the methods of LaRoque and Herbert Sugar. But instead of that or of circumscribing the growth with a ring of coagulation well out into the uninvolved tissue, and then carefully and deeply coagulating the growth itself with a small flat disc electrode or by multiple application of the coagulation needle and then ablation with the curet or the cutting current with moderate coagulation, they invariably turn on the cutting current at the beginning, ask-

ing for "lots of juice," with results and prospects far inferior even to intelligent scalpel surgery. There has been equally as much manipulation and trauma as well as hemorrhage and consumed time. Instead of coagulating the cancer cells *in situ* and removing them as a harmless mass of coagulum, they have been manipulated, traumatized and scattered about the operative field in masses of lawless and death-dealing hordes that have had ample opportunity to invade the lymph and blood stream or to implant themselves upon new sites in the bladder and incised abdominal wall. The same applies, with appropriate modification due to regional anatomy, to their use of surgical diathermy in other areas. In their desire for speed they have no patience for the slower method of coagulation. We believe, however, that they really gain no time as the cutting method consumes time in controlling hemorrhage that does not occur with proper coagulation.

These statements are not made with a view to decrying the use of the cutting currents. In breast amputations, for instance, the cutting current is an ideal aid. But so frequently one sees it used where not properly indicated — where the interests of the patient as to total destruction of the local condition without undue manipulation are not fulfilled.

With the great number of high frequency machines equipped with cutting currents now available in surgeries, it is believed that a timely warning should be sounded as to their inappropriate use if we are to continue to believe in the dangers inherent in over-manipulation of malignant growths during operation and the possibilities of implantation and dissemination of viable cancer cells upon normal tissue through open vascular and lymphatic channels.

For an excellent description of team work in the combined use of the cutting and coagulating currents, reference is made to the presentation of the radical operation for cancer of the breast by Dr. Nelson H. Lowry before the Clinical Congress of the American College of Surgeons. The entire operation, even to the dissection of the auxilla, is made with the cutting currents, aided by the coagulating current in maintaining hemostasis.

As time goes on and our series of surgical diathermy cases increases in number and variety, we are more and more convinced that the procedure is fulfilling a long-felt need. Along with improvement in equipment should go improvement in technic, and this, as a rule, has been the case. However, there is the need for standardization through the grouping of all of the best points into a correlated unity, and the publication of same through proper literary channels and such helpful meetings as these.

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THYROIDLESS GRAVES' DISEASE FOLLOWING X-RAY TREATMENT *

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The combination of so-called hypo- and hyperthyroidism following subtotal or total thyroidectomy in the treatment of exophthalmic goiter or Graves' disease is not uncommon. The term "hypo- and hyperthyroidism" is a misnomer, because exophthalmic goiter is not hyperthyroidism. Rather than exophthalmic goiter, we should employ the term Graves' disease — a term which does not imply the imperative existence of exophthalmos and goiter, for in many cases neither exophthalmos nor goiter is present. The element of thyroid involvement in Graves' syndrome is not causal, but rather incidental or sequential, as is the splenic swelling in typhoid fever. The spleen in typhoid is a defensive reaction against toxins originating from the general infection; the thyroid swelling in Graves' disease is a similar process in which the organ, a vital element of the immunizing processes of the body, attempts to protect the individual against toxins originating from the dysfunction of all the ductless glands and of the vegetative nervous system.

Hence it is that when evidences of thyroid inadequacy follow subtotal or total thyroidectomy, and despite which there exist such evidences of the original syndrome as bulging eyes, nervousness, palpitation, and emotionalism, instead of terming the condition a combination of "hypo- and hyperthyroidism," we should regard the clinical picture as one of hypothyroidism in combination with persistent evidences of Graves' syndrome.

Surgical ablation of the thyroid is not the only procedure often followed by symptoms of combined hypothyroidism and Graves' syndrome. At this writing we have had a series of 18 cases of this sort that applied for relief of symptoms following excessive x-ray therapy. Roentgen ray treatment had been applied injudiciously, the result corresponding to that of complete thyroidectomy bloodlessly performed. Commonly telangiectatic spots are visible over the thyroid area and the skin is atrophied and parchment-like. Deep palpation fails to disclose more than a somewhat fibrous band corresponding to where the thyroid gland should be. The patient is virtually a thyroidless individual, with a basal metabolic rate varying between minus 20 and minus 40 per cent, and complains of persistent, distressing fatigue, excess in weight despite poor food intake, dry skin, falling hair, brittle nails, sluggish elimination, persistent drowsiness, yet marked insomnia, nervousness, palpitation, flarability of the heart rate, exophthalmos, (which is often extreme) and emotionalism.

The fault in these cases resides not in roentgen therapy, but in *inexpert* roentgen therapy. Properly applied, I feel that x-ray attention of the hyperplastic thyroid of Graves' disease is an asset in therapeusis. While, as an endocrinologist, I do not agree with enthusiastic roentgenotherapists who claim a very large percentage of perfect cures from this measure alone, I feel that x-ray treatment is a valuable supplement within a broad régime of therapeusis in which the rest program, a proper diet, carefully selected medicaments, and psychotherapy play their respective rôles in the grand totality of results. I have observed at close range in consultation and at our Goiter Institute over 4,000 cases of Graves' disease during a period of more than two decades, and I have seen a majority of them get well without either surgery or x-rays. I feel, however, that expertly applied x-ray attention in combination with expert medical attention is most likely to yield perfect, permanent recovery.

Inexpertly applied x-ray or radium treatment is almost as dangerous to the patient as is thyroidectomy by the casual operator. Hence the x-ray technician should be one who has been carefully trained not only in the means of application of this form of therapy, the dosage and other details, but in the understanding of the disease itself and of the type of patient possessing it. It is only by such care that roentgen therapy, a potent ally in the armamentarium of the attending physician, can do most good and avoid the clinical picture of permanent invalidism resulting from total destruction of the thyroid.

* From the Bram Institute for the Treatment of Goiter and Other Diseases of the Ductless Glands, Upland, Pa.

ROENTGEN RAY THERAPY IN DERMATOLOGY *

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Some two decades ago William Allen Pusey stated that roentgen therapy was the most useful addition to the treatment of skin diseases that had been made. More recently MacKee has remarked that roentgen therapy is the most useful single remedy available for the treatment of skin diseases.

The therapeutic potency of roentgenotherapy is so well established that it requires no further argumentation or exposition. In fact, the excessive use and abuse of x-ray constitutes the outstanding problem of dermatologic physiotherapy today. The magic of its therapeutic power lures the would-be dermatologist, who happens to own an x-ray transformer, into the indiscriminate use of it in a host of cutaneous conditions which could be controlled as well or better by other therapeutic measures. No clinician is qualified to use any physiotherapeutic agencies in the treatment of skin diseases unless he is competent to make intelligent interpretation of the skin lesions — to effect a correct dermatologic diagnosis — and is capable of using other dermatologic methods of treatment. An elementary training in diagnostic and therapeutic technic is a much more important qualification for a physiotherapeutist treating skin diseases than the mere technical and mechanical knowledge of physiotherapeutic apparatus. A technician may make splendid roentgenograms, but it requires an experienced x-radiologist to properly interpret the plates and give an accurate diagnosis. Likewise, it requires an experienced dermatologist to interpret skin reactions, establish a correct diagnosis, and to know just what type of therapy will cause involution of that particular cutaneous pathology.

A large number of superficial inflammatory dermatoses can be cured without x-rays, and a still larger number can be cured with only small amounts of radiation. In fact, x-ray alone produces permanent cures in a relatively small number of skin diseases.

Dosage in Dermatology

The most common error in dosage, from a dermatological viewpoint, is over treatment and excessive use of x-ray. It is used in many more cases than is necessary and in greater quantity and quality than is needed. X-ray is indicated primarily in localized and infiltrating dermatoses. A generalized or universal dermatosis is by itself a contraindication for the use of x-ray except for very small doses to a few areas, judiciously administered.

Professor Milani of Perugia, at the third International Congress of Radiology, stated that the treatment of areas of inflammation with roentgen rays was a method of recognized therapeutic value and that the majority of authors advise irradiation with small doses, the optimum being placed at 20 per cent of the erythema dose. The greatest benefit of roentgenotherapy is derived in localized acute and subacute inflammatory process.

The majority of inflammatory dermatoses respond to one-sixth and one-fourth skin unit doses weekly. Lichenoid, sclerotic, verrucous dermatoses and deep granulomata require larger doses, such as one-half and three-fourth's skin units. Epilation requires a single carefully administered skin unit dose, while malignancy requires one or more massive doses. A five to six inch spark gap, 88 to 100 kilovolts, will produce x-rays of sufficient quality in the majority of the inflammatory dermatoses, and even less, in most of the more superficial ones. Only in deeply infiltrated lesions, deep granulomata and malignancy is greater kilovoltage or a filter required.

Histopathologic studies have definitely shown that even x-rays of such low voltage as Grenz Rays (ten kilovolts) produce degenerative changes in the deepest portion of the cutis, far below the level of the pathology observed in the common dermatoses.

The pathology observed in various types of dermatoses is as important as that of neoplastic tissue as regards radiosensitivity. The acute and subacute inflammatory dermatoses

* Read before the Texas Radiological Society, Waco, Texas, May 4, 1932.

ROENTGEN RAY THERAPY IN DERMATOLOGY

Exposure	Accumulation										
	Without producing erythema				Commonly	Erythema after each exposure					
	Sub-fractional	Fractional	Semi-intensive	Sub-intensive	Intensive	Hyperintensive				Ultra Intensive	
Intensity in skin units (1)	1/16-1/8	1/4	1/2	3/4	1	1¼	1½	1¾	2	2¼	2½
Intensity in R unit (2)	21-45	85	170	255	340	420	510	595	680	765	850
Interval between exposures	not more than s.u. per.wk.	once weekly	every 2 weeks	every 3 weeks	every 4 weeks	After complete disappearance of Erythema					
						2-4 weeks after		Immediately after			
Biologic Response	Inhibition of Cell Function										
	Temporary					Permanent					
Pathologic Indications	Inflamatory Processes					Neoplastic Processes					
	Simple Inflammatory			Granuloma		Neoplasms					
	Acute	Subacute	Chronic	True	Resemble Neoplasms	Benign			Malignant *		
Clinical examples depending on stage of lesion	Acute Dermatoses	Acne Psoriasis Lichen Planus Neurodermatitis Eczema	Indurated-Infiltrated lesions. Keloids Disease of Nails palms, and soles. Furuncles	Mycosis Fungoides Leukemia Tuberculosis Blastomycosis Actinomycosis Sarcoids	Koposi Sarcoma Hodgkins Disease Keratoses Verruca Callosites	Basal Cell Epithelioma Benign Cystic Epithelioma Multiple Flat Epithelioma Bowens Disease			Prickle Cell Epithelioma Basal-squamous Cell Epithelioma Melanoma Sarcoma		
Technic and Indications	Generalized Eruptions irradiated in -		Depilatory and Inhibition of gland function			Therapeutic value Prophylactic value before and after operation					
	two sections	three sections	Individual lesions or small areas closely screened to protect surrounding tissues.								

(1) MacKee Skin Unit
(2) R Units which correspond to MacKee Skin Unit.

* Requires 6 - 10 S.E.D.

are characterized by lymphocytes, polymorphonuclear leucocytes, and connective tissue wandering cells. They are the least resistant of all pathological cells and are the most readily influenced by roentgenotherapy. Chronic inflammatory tissues are characterized, in addition to the above, by connective tissue cells (fibroblasts) which are more resistant and less readily influenced than the lymphocytes.

Inflammatory epidermal cells have a lowered resistance to radiation because of the inflammatory reaction; i. e., edema, etc., and respond to roentgenotherapy more quickly than do normal epidermal structures.

Granulomas are characterized by the addition of plasma, epithelioid and giant cells which are still more resistant and less readily influenced than the inflammatory cells.

Hyperplasias have an increase in tissue elements (cells) of relatively normal character and require greater dosage.

Neoplastic tissues vary according to the tissue from which they originate, their location, vascular supply, degree of anaplasia, metaplasia, and desmoplasia. The more adult the structures, the more resistant and less readily they respond to radiation. Therefore, individual histologic studies are of value for determining the degree of radiosensitivity of a tumor.

The following table will outline in a general way the indications, technic and dosage of roentgenotherapy used in the various types of dermatoses:

Summary

1. Roentgenotherapy is used too frequently and in too large doses, especially to the exclusion of other therapeutic measures.

2. The clinician must be able to make a dermatologic diagnosis before instituting roentgenotherapy, and be able to use other therapeutic measures which will produce the most rapid desired results.

3. The therapeutic skill of using x-ray in skin lesions is measured by the smallest amount of x-ray used in obtaining the desired therapeutic result.

4. A knowledge of the pathology of the cutaneous lesions is of great value in estimating the amount of roentgenotherapy required.

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Hydrotherapy at Kankakee State Hospital *

Hydrotherapy is an old remedial agent, but not until comparatively recent years has this cheap, easily accessible medium been given much consideration in the treatment of disease. For centuries many lay people have used it and advocated its beneficial effects, but not until Dr. Winternitz of the University of Vienna took up the study of hydrotherapy and put it on a scientific basis, did it gain much prestige. Dr. Winternitz, sometimes called the "Father of Hydrotherapy," expounded the one great principle that makes it of such value, especially in institutions for nervous and mental disorders. Because of the primary effect of water upon the nervous system, hydrotherapy today is playing a major rôle in the treatment of mentally ill patients in various institutions.

The nervous system, by means of which all body functions carry on their activity, is capable of being stimulated and depressed. Water, when applied at certain temperatures, with or without pressure, and in various durations, affects the nervous system in either one of these ways. Mechanical apparatus is necessary sometimes to give certain forms of treatment.

At the Kankakee State hospital hydrotherapy is stressed in the treatment of mental illness. There is no central hydrotherapy treatment room, the work being divided into male and female service. In connection with each male and female hydrotherapy ward is a so-called treatment room. This room is isolated from the tub-room and the remainder of the ward. It is bright and cheerful, the walls and floors being painted in light, comforting colors. The equipment consists of an upright and reclining electric cabinet, pack table, sitz bath, and control table, by means of which various douches and sprays are given, such as the Scotch douche, fan douche, jet douche, rain douche, and needle spray. The treatments given in this room are the electric cabinet baths, salt glows, sitz baths, and the various douches listed above. Each has its particular advantage in different types of disease.

Patients are brought to the treatment room from the various wards of the institution. A prescription for the type of treatment is ordered by the physician in charge of the ward in which the patient resides. To be of the greatest benefit, the treatment should be enjoyable to the patient. The hydrotherapist and nurses can do much in winning the confidence and willingness of the patient to take treatments. Seldom, however, unless the patient is very disturbed, is there any objection. In fact, patients have been known to ask for treatments after being taken off the list to make room for those more in need of attention.

The electric cabinet baths are of two types. They may be a stimulant or a sedative, depending upon the duration of the treatment. For the stimulating effect, the patient remains in the cabinet up to the point of perspiration. During this time, all body functions, that is, blood and lymph circulation, elimination, and the nervous system have been called to greater activity in reaction toward heat. It is obvious that the duration of this type of bath depends upon the individual, some persons perspiring at a much lower temperature than others. Patients with poor appetite, loss of weight, poor muscle tone, and cyanotic extremities, such as we find in the dementia præcox group, receive this type of cabinet bath in connection with salt glows and Scotch douches.

The eliminating cabinet bath is given to induce perspiration, the duration again depending upon the individual, but generally given for a period between ten and twenty minutes. In this cabinet bath, toxins are eliminated, muscles become relaxed and nervous energy is lessened. As heat has a depressing effect on the heart, care must be taken to avoid collapse. Cold compresses to the throat and head,

* Petra E. Nelson, R. N., *Welfare Bulletin*, August, 1932.

an ice bag on the heart, and plenty of fluids to drink tend to counteract any adverse symptoms that might occur. Alcoholics, drug addicts, maniacs, excited præcoxes, psychoneurotics and other agitated forms of mental illness, as well as any physical condition such as neuritis, rheumatism, common colds, etc., are treated by the long cabinet bath. It is gratifying and interesting to see the weekly improvement these particular patients show. Many a manic attack or disturbed state of a præcox has been averted, when recognized at an early date and treatment prescribed.

A salt glow is a procedure in which the patient stands in a foot-tub of warm water while moistened iced salt is applied to the body with a to-and-fro friction. The salt acts as a chemical irritant to the skin and a stimulus is produced by the rubbing of the sharp crystals on the body. Circulation and muscle tone are improved and mild skin eruptions as found especially in dementia præcox cases are cleared up. Following a salt glow the body is washed, usually with a Scotch douche or an alternating douche.

These two douches are given by means of a control table which is equipped with appliances for regulating temperature and pressure. They resemble each other, in that they employ both hot and cold water. They differ, in that the Scotch douche consists of a single application of hot water from one to five minutes, followed by a short application of cold water, while in the alternating douche, hot and cold are repeatedly applied alternately. The water is applied by means of a nozzle and at a pressure between thirty and fifty pounds. Pressure acts as a massage to the body and may be increased or decreased, thereby getting a greater or lesser degree of stimulation. These treatments are subject to a great variety of modification. The longer the hot application, and the shorter the cold, the less pronounced are the stimulating effects. The treatment is always given according to the patient's physical condition and reactive capacity. The alternate douche is given for a variety of effects, but the purpose for which we use it is principally as an excitant — to stimulate skin activity, circulatory functions, and inactive nervous systems. These treatments have a psychic effect on patients. They sleep better, gain in weight, take a personal pride in their appearance, and become more sociable and less difficult to handle on the wards.

In the treatment room for men, the neutral pack is administered. A pack is a procedure in which the whole or part of the body is enveloped in a sheet wrung from water at a temperature of about 94 degrees Fahrenheit, and blankets applied in a systematic manner. All types of patients are treated, with the result that disturbed patients become quiet, and the apathetic, depressed cases greatly improved in physical and mental condition. If possible, packs should be given before a patient reaches a badly disturbed condition. A cooperative patient gradually becomes accustomed to being bound in sheets and blankets and packs are made by the nurse in charge. These show at a glance the daily progress made by patients.

Disturbed patients in which treatments and packs are indicated remain on the hydrotherapy ward until sufficiently recovered to justify their return to their residential wards. While on the hydrotherapy ward they are given packs and continuous baths. In a continuous bath the patient is immersed in a tub of constantly flowing water, which, by means of an automatic device, never varies more than two degrees in temperature, the range being from 94 degrees to 96 degrees Fahrenheit. He remains in this bath for several hours, usually from four to six. He is loosely clothed with a bath suit of muslin and reclines in a canvas hammock suspended in the tub. In this hammock he has the free use of arms and legs.

As a sedative, hydrotherapy has taken the place of the drugs formerly used.

It is interesting to note that on the men's hydrotherapy ward, hypodermic injections of habit forming drugs, such as morphine and hyoscin, have decreased from 130 in 1922, to 2 in 1931, with not one recorded in 1932. Hydrotherapy is the answer to this marvelous record.

AWARDS OF MERIT BY THE AMERICAN CONGRESS OF PHYSICAL THERAPY

Decorations, medals, badges and citations have long been in vogue with ruling or military authorities to reward conspicuous service to the state in time of war or peace. Scientific bodies and endowed organizations have adopted similar measures of award in the form of material emoluments, subsidies, medals or certificates of honor, not only to reward workers in humane endeavors for distinguished service to the cause of science but to stimulate special efforts for the benefit of mankind.

Appreciating that human psychology is such as to crave some form of recognition or distinction for special accomplishments, the

Board of Governors of the American Congress of Physical Therapy decided to award annually a gold key or a certificate of merit to such members of the medical and allied professions who have rendered extraordinary service to the cause of Physical Therapy. At the convention just held in New York this honor was conferred upon seven men whose names and citations are given below. The Board of Governors of the American Congress of Physical Therapy expresses the hope that the award of similar tokens of recognition will become a permanent feature of the annual conventions.

While original research will be considered for the highest honors within the power of the Congress, arrangements have been perfected to accord due recognition to such workers whose efforts have proved of tangible value to Physical Therapy.

The following men have been honored by the Congress at the 1932 convention:

Jacques Arsène d'Arsonval. Illustrious Son of France. Professor Collège de France, Paris. Grand Officier de la Légion d'Honneur, Pioneer Electro-Physiologist. Discoverer of the Medical and Surgical Application of the High Frequency Current. Pathfinder and Savant in the untrodden fields of Electro-Physics. Benefactor of Mankind.

William L. Clark. Distinguished Son of Pennsylvania. Pioneer in the field of Electrosurgery of Malignancies. Father of Electrodesiccation. Brilliant Surgeon. First Vice-President of the Congress.

Frederick de Kraft. Distinguished Son of New York. Discoverer of valuable Apparatus. Inventor of a Spark Gap. Pioneer in Static Electricity. Past-President, American Electrotherapeutic Society.

F. Howard Humphris. Distinguished Son of Great Britain. Officer of the Order of St. John of Jerusalem. Chevalier of the Belgian Order of Leopold. Pioneer in Electrotherapy and Ultraviolet Radiation. Distinguished Contributor to the Literature of Physical Therapy. Author of outstanding Works on Physical Therapy.

Howard Kelly. Illustrious Son of Maryland. Dean of America's Gynecologic Surgeons. Professor Johns Hopkins University. Author of Standard Works on Gynecologic Surgery. Pioneer in Electrosurgery and Champion of the Radium and Electrosurgical Treatment of Malignancies.

Gustav Kolischer. Distinguished Son of Austria and of Illinois. Formerly Clinical Instructor University of Vienna. Pioneer and Dean of Urologic Surgeons. One of the First and Foremost Workers in Cystoscopy. Pathfinder in Urologic Electrosurgery. Discoverer of a Spark Gap. Savant. Brilliant Author and Contributor to the Study of Malignancies and Genito-Urinary Surgery. President of the Congress.

Albert F. Tyler. Distinguished Son of Nebraska. Professor Creighton University. Pioneer in Radium Therapy and Electrosurgery of Malignancies. Founder of the Congress. Distinguished Author and Contributor to Radiologic Literature. Former Editor ARCHIVES OF PHYSICAL THERAPY, X-RAY AND RADIUM. President-elect of the Congress.

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EDITORIALS

NEED FOR UNIFIED EFFORTS IN ARTHRITIS

In no other division of medical practice has physical therapy so convincingly demostrated its healing and reconstructive powers as in the arthritic state. From time immemorial the curative powers of manipulation, exercise, massage and waters have been utilized with gratifying effects. The blending of artificial agencies which produced various modulations of heat, light and mechanically regulated stimulation of the softer structures has materially added to the flexibility of physical therapy procedure. That exuberant, adolescent period when fancy was often translated as fact — the sophomoric period of its evolution — has now been replaced by a mellowing experience in which trial and error played an important part. It was only through the crucible of experience that a more solid and lasting structure was erected.

Probably the most significant lesson derived from this has been the fact that there exists today no isolated outstanding specific in the treatment of arthritis. It is a malady that requires more than drugs or physical measures alone to eradicate. It is a problem that is influenced by important economic and social factors which require the most intelligent cooperation of the best in medicine and physical therapy. It is a situation wherein disappointments have traveled side by side with great satisfactions. Symptomatic relief has been achieved by medicinals or no medicinals, by

prayer and by suggestion, by manipulation and in spite of manipulation, by heat, diathermy, ultraviolet or what have you. The history of man's struggle against this protean disease reads like the ceaseless and futile washings of the ocean waves against rugged shores. From time immemorial trial and error like restless and perennial tides have dashed their efforts against this crippling malady to be thrown back again into the vortex of experience without apparent success. But man's efforts in spite of blind directions often have brought forth priceless experiences that are as crystal clear in value as have been the senseless washings of the tides against the unyielding surfaces of the earth.

Scientific medicine is today in possession of certain facts regarding the treatment of arthritis that largely take the management of these invalid individuals out of the class of guesswork. It is now realized that the greatest success can only be obtained by unified efforts from all intelligent medical sources in which diagnoses and therapy play an important part. That physical therapy here plays an important rôle is undoubtedly true. It must, however, be stressed that its value is hardly as great as its enthusiasts would lead us to believe, and by the same argument it must also be pointed out that its value is supremely greater than that which disoriented members of the profession have heretofore adjudicated to its province. It is an important section in therapeutics, the success of which largely depends on an intelligent interpretation of the facts in back of the condition to be treated.

It is needless in this day of conservative and scientific medicine to point out that a large portion of the problem is still to be solved. Monumental contributions have already been added to the edifice of this topic. One realizes the intricacies related to the causal factors behind it. Goldthwait's classification has materially reduced many of our difficulties not only insofar as diagnoses is concerned but also as regards treatment. The eradication of focal and toxic process' is now accepted as the first requisite toward the success of treatment. The pendulum has swung toward greater conservatism in the wholesale enucleation of tonsils. The tonsil or the tooth is no longer a challenge for its removal except on logically, indicated grounds. Greater attention is now devoted to foci's of exit, such as the colon and the prostate. Medication has been reduced to essentials.

Physical measures are now more generally advocated for the local and general reconstructive purposes, such as convective and conductive heat in acute states, and conversive or diathermic heat in the subacute and chronic conditions. Ultraviolet radiation has gradually come to be regarded as a tangible source of great therapeutic value, and its universal adoption in all varieties of arthritis is only a matter of time or, perhaps, is dependent upon a greater orientation with its reconstructive metabolic values. Indeed, these values by far overshadow its antirachitic specificity. The importance of manual and mechanical manipulation in relation to arthritis has long been recognized. An extraordinary appreciation of these last measures is now in vogue. There is an unfortunate paradox in this situation, in that as organized medicine has lauded its values above those of other physical measures, the practitioner oriented in all physical procedures has now discovered inherent limitations that often can be favorably influenced when other agencies are used in conjunction or independent of it. This is but an inevitable corollary in the evolution of medical progress: with greater experience limitations as well as greater possibilities are often discovered.

A paper elsewhere published in this issue presents the favorable effects of therapeutic exercise and manipulation in the condition of chronic arthritis of the spine. This problem, always most trying in the best experienced hands, is presented with a therapeutic unity advocated by us for arthritic conditions in general. The authors' Swaim and Kuhns have layed down a premise that should appeal to all rational physicians, namely, "The ideal therapy in any disease is a restoration of anatomical structure and a return of normal function." Authorities are generally agreed that this is the desideratum attempted by scientific medicine. A great deal of comfort is, therefore, to be derived from the fact that orthodox medicine in America by means of diplomatic, tolerant and non-coercive methods has finally organized the therapeutics associated with physical procedures into a controllable, unified organ of service to scientific medical practice. This offers great promise for future medicine in that many of the arthritics prog-

nosticated as incurable by medicinals alone will now have the added advantage of physical procedure under oriented guidance.

Reference

Swaim, Loring, T., and Kuhns, John G.: The Treatment of Chronic Arthritis of the Spine. *Arch. Phys. Ther., X-Ray, Rad.*, **13**:517 (September) 1932.

NEW HISTORY MADE IN PHYSICAL THERAPY AT THE ELEVENTH ANNUAL SESSION

Seldom has a medical association convened with such enthusiasm as that which was displayed by the American Congess of Physical Therapy in its eleventh annual convention at New York during the early part of the month. In this day when medical gatherings of all sorts have been attended by smaller groups than usual, the foregoing event stands out prominently as one of the successful scientific sessions of the year. With an attendance well over the thousand mark and representatives from nearly every state in the Union, and from Canada, interest was maintained at such a high level that several of the sections suffered from insufficient space to accommodate the large numbers who came to listen to the numerous addresses on timely and important topics.

From this it is quite evident that Physical Medicine has not forced its way into modern therapeutics. Instead, it has been admitted gracefully because progressive physicians and surgeons foresaw the possibilities of improving the results from older treatment methods. No one will dispute that fever therapy with diathermy in paresis and in other chronic diseases is a substantial contribution to medical science. No one will argue against the value of light therapy in rickets and in other deficiency diseases. A large majority of the profession is finally awakening to the merits of electrosurgery for accessible malignant growths and for extirpation of diseased benign tissues. The profession in general appreciates the virtues of radium, x-ray, massage and corrective exercises. Any or all of these branches are capable of serving useful purposes. While their true values have been repeatedly demonstrated in everyday work, the newer developments for specific undertakings usually come from large medical conferences. Such was the Eleventh Annual Congress session. The many new subjects which were presented for the first time, the reports of progress with some of the later therapeutic aids, and the general presentation of personal experiences altogether formulated a program which occupied a full week during which interest increased as the days passed by. When Friday evening came and the last sectional meeting adjourned at six o'clock, the attendance had suffered little. Certainly the interest was still at a high pitch, and those who were not in haste to return to their daily routine, anxiously awaited Saturday for the clinics which were conducted in practically all of New York's prominent hospitals.

The convention opened auspiciously on Monday evening, September 5th, with the President's dinner. It was a delightful occasion, well attended, and with a fine local representation. The President's dinner was a novel event on Congress convention programs, and the success of this one prompts its repetition at future annual meetings. Few and brief speeches characterized the occasion, the main features of which were the award of distinguished service keys to several pioneers in physical therapy by Dr. Roy W. Fouts, representing the Board of Governors, and by President F. H. Ewerhardt, and the evening lecture on "Historical Figures in Physical Therapy," by Dr. H. M. F. Behneman of San Francisco.

The scientific program opened on Tuesday morning after several addresses of welcome had been made by representatives of the local county societies and by our foreign guest of honor, Dr. F. Howard Humphris, of London, England, who represented the English societies and the Order of St. John of Jerusalem. Then followed the induction of the president-elect, Dr. Gustav Kolischer of Chicago, and his address, "Newer Considerations of Diathermy in Malignancy." Dr. Humphris' address was on the treatment of health by sunlight.

The sectional meetings convened in the afternoon and on each afternoon of the week through Friday. All the specialties in medicine and in surgery were duly represented. The section on Eye, Ear, Nose and Throat was very well attended, so that when the symposium on electrosurgery of the tonsils was in session, the crowd overflowed into the corridors. The symposium on electrocardiography in the section on medicine also attracted a large audience. The subject of diagnosis is

always regarded as important and especially so when dealing with the heart.

Other symposia which provoked lively discussions were the ones on tuberculosis, fever therapy, electrosurgery, arthritis, urology, and the one on corrective exercise and orthopedics. These symposia were presented by conscientious clinic and research students whose discussions were further enlivened by interested colleagues who always seek to exchange views with their co-workers.

The educational conference served a very definite purpose: first, the physician's aspect was presented, then the technician's. The technician's problem, so far as physical therapy training and education are concerned is now receiving the attention which it merits. A closer contact has been attained, and as a result a better understanding is now possible. This is the first time that the technicians have been given an opportunity to discuss their own problem of education in symposium form. Technicians' organizations were represented by capable essayists, and the exchange of views which resulted from their presentations will aid eventually in the regulation of the educational problem.

The new sections, the one on stomatology and the other on colonic therapy, conducted full programs on Friday, the last day of the meeting. These programs were prepared by capable leaders in their respective specialties. The papers dealt with the newer developments in the work. From the interest manifested and the large attendance attracted, these new sections should become permanent convention fixtures.

Aside from the scientific program there were other important developments which probably will do much towards promoting the interests of physical therapy in general. There is a movement on foot to consolidate all physical therapy societies, the purpose being to have the specialty represented by one strong national organization. Several sectional associations have already approved of the plan and only formal action is necessary to put it into effect officially. Within a fortnight final action will be taken by another national body, and if the plan of amalgamation is accepted, the Congress will be the only national medical body promoting exclusively the interests of physical therapy. If the annual session served no other purpose than this one — the unification of physical therapy organizations in this country — it served a most useful purpose.

New York did its job well; New York has real workers. Much of the success of organizing local interest is due to the zealous work of the local Chairman, Dr. Norman E. Titus. He was ably assisted by Drs. McGuinness, Bierman, Kovacs and Wolf, all of whom gave up much of their time to the performance of many duties involved in a large annual convention. The Congress extends a vote of thanks to this local group and wishes to place on record the fact that its efforts had much to do with the large attendance and the continued interest. This was the first annual session in the East. The precedent set was a good one, and from now on, it is certain, there will be a greater eagerness to go East again before long for other annual gatherings.

The Congress is to be congratulated on its new president and its other new officers. Dr. A. F. Tyler, the president-elect, is one of the founders of the Congress. It was his keen foresight which had much to do with the growth of the present organization. Due to his efforts and those of a few others who sustained the small original group, the present society developed. He has stood by at all times ready and willing to help; he has given unselfishly and has taken nothing in return. The ARCHIVES which was his private property was presented by him to the Congress free from all obligations. He has long deserved the highest honor which the Congress can bestow upon him and now it is his. Dr. Tyler is a pioneer in physical therapy and a roentgenologist of national reputation. He holds a clinical professorship in physical therapy and roentgenology at Creighton and merits the high standing in this department. The Congress is indeed pleased to have the opportunity of announcing Dr. Tyler as its president-elect.

At the two brief business sessions several important matters were considered. It was announced that more than fifty new members had been added to the roster during the last fiscal year, and approximately fifty had filed applications at this meeting. Chicago, the World's Fair City in 1933, will be the next meeting place. The dates have been set as September 11th to 16th. The Palmer House has been selected for the official headquarters, and all meetings and exhibits will be housed

under its roof. It is the intention of the committee to conduct an international Congress in 1933, and plans are already under way to make this feasible.

It is hoped that the 1933 convention will enjoy the enthusiasm and interest of the 1932 meeting. Chicago will strive hard to outdo New York, fully appreciating that much effort will be necessary to accomplish this. The spirit of the World's Fair may help. Let's all get together for a big session in 1933!

THE MEDICAL WORLD FOR MEDICAL MEN*

Permit me to exemplify from a general scope on the special merits of our society. I submit as a proposition: "The Medical World for the Medical Men."

In a good many quarters it is claimed that in the United States, medical progress is somewhat impeded by the fact that most of the medical institutions are controlled by laymen. Because of this situation the professional members of the staff are more interested in currying favors with the lay board than in scientific developments. On the other hand it is argued that doctors are poor administrators and that professional jealousies interfere with the recognition of the leaders qualified to be such by virtue of their scienentific attainments and their innate driving force. Now let us analyze the attitude of our association toward this controversy. I will state in advance that I consider it one of the great merits of our society that it helped clearing up the whole situation.

You all remember the disagreeable experiences we had to go through in the early period of developing physical therapy. We were considered to be fakers and it was intimated to some of our members that they were apt to impair their professional standing by joining our ranks. All this has been changed under the added influence of our society.

In the present time when the general public shows a united front against the medical profession this is quite an asset. Permit me to steal the thunder of a famous French literate who at the occasion of his interceding in one of the most spectacular vocational trials, prefaced each of his statements with the words, *J'accuse,* (I accuse). In contrast I shall paraphrase the above by initiating each of my remarks with the words, "I praise." I praise this association for having always conducted itself on a strictly professional basis independent of extraneous influences. As a matter of fact the physical therapy societies were instrumental in inducing all prominent medical units to establish departments devoted to physical therapy.

I praise this association because early in its career it recognized one of the most important factors for medical advancement, that is to apply to practical use the accomplishments of other scientific disciplines. Under this influence we turned to study modern biology and physiology and the teachings of our physicists.

I praise this society because it cultivated and maintained one of the outstanding American traits, that is, extending a helping hand. Everybody who wanted to contribute to our scientific meetings was welcomed and has found his place irrespective of his personal connections.

I praise this society because all its scientific sessions were conducted in a strictly scientific manner. While we all, of course, believe in constructive criticism we have never tolerated vicious personal attacks. Every controversy was an upstanding fight and all illegal holds were barred.

I praise this society because it created an atmosphere of good feeling among its members and guests, thus putting real meaning in the term medical fraternity. At occasions like our meeting, when a whole year's work is compressed into a few hours, one opens his heart, and everybody feels like doing something for the other fellow — an item of great humane interest.

I praise the men who by their indefatigable and unselfish efforts made this society what it is today, and the most unstinted praise must go to our human dynamo, Dr. Hollender.

I may be permitted to add another personal note; of all the many beautiful things this country has given to me, a foreigner by birth but not at heart, not the least ones are my membership in this society and the great honor you conferred on me by having elected me president for the coming year. I am convinced our future is secure and this society will find its merited place in medical history.

* Abstract of presidential address delivered by Dr. Gustav Kolischer at the President's Dinner, September 5, 1932, during the Eleventh Annual Session of the American Congress of Physical Therapy, Hotel New Yorker, New York.

THE SECTION ON COLON THERAPEUTICS

The large attendance that found itself overflowing into the corridor of the meeting hall where the section on Colonic Therapy held its initial session as part of the recent Convention of the Congress in New York, was perhaps the most surprising index of the growing interest in this field of therapeutics. It was necessary to temporarily interrupt the session to provide larger quarters. The addresses and discussions were both conservative and timely, and well anticipated the progress already made in this branch of medical practice.

The foregoing section was initiated by the pressure of popular demand and was organized with the vision of placing its discipline under control of organized medicine rather than to permit it to gravitate into an anarchistic, degenerated pseudo-medical endeavor. Past experience has taught the costliness of indifference when progressive medicine relinquished without struggle its valuable assets in physical therapeutics and permitted disorganized and borderline practices to write it into their therapeutics under the legal protectorate of licensed enactment. Our somnolence in the foregoing situation now forms a chapter which future medical critics will speak of as negligence in the face of opportunity. For not only did it delay the progress and the recognition of physical therapy procedure by the blanket of condemnation it placed upon those who honestly saw virtue in its uses, but it delayed scientific initiative in those who were motivated by highest ideals.

The belated recognition of physical therapy by organized medicine should be a lesson which sees responsibility well mixed with tolerance. As such the Congress has extended encouragement to those in the medical profession who wish to study the clinical advantages and disadvantages, the limitations and possibilities of colonic therapy and to annually discuss in separate section the progress in this field. It is logical to conceive that such encouragements under benevolent but intelligent supervision will be conducive of bringing forth controllable and well authenticated clinical and laboratory observations of benefit to medicine.

In order to advance the progress of this section into conservative channels and to prevent fortuitous adventures not in line with the highest ideals of scientific medicine, the section has selected as its Advisory Council for the ensuing year four practitioners of medicine distinguished in their respective fields: Anthony Bassler, New York; Richard Kovács, New York; George J. Ott, Boston; Lynn J. Walker, Milwaukee. The chairman and secretary are respectively: J. W. Wiltsie, Binghamton, New York and F. A. Cummings, Providence, R. I. The section has the best wishes and the assured cooperation of the Congress. The Congress in turn feels confident that the above named body will guide this practice through the fanciful speculations that have sprung about this discipline into such scientific channels as will redound to the credit of organized medicine. It is an undertaking worth the adventure.

THE NEW SECTION ON STOMATOLOGY

The evolutionary trend of medical and allied specialties to regard physical procedures as an indispensable part of its practice is brought home to us once again by its increasing favor in the related specialty of Stomatology. The stamp of approval placed upon it by this respected group in the recent formation of a special section as an integral part of our Congress was largely inspired by the growing appreciation of those already experienced in the various modulations of physical medicine as related to Stomatologic practice. The conviction that such a section would seriously contribute a more broadening and facile influence to its therapeutic endeavors was the basis for the birth of this section.

It is realized that the nature of disease, its causal factors, its aberrations, variations and patho-physiologic changes is based upon scientific premises applicable in a general sense to all living structure, be that the stoma of entrance or exit. The logic of this fact is so obvious to contemporary students of medicine and related practices that both have looked with favor on such efforts as would successfully bring about a state of unity, understanding and cooperation between them.

Progress in Stomatology has reached a stage of such importance that dignified recognition has been accorded to it by scientific medicine. Within its field it has supervision over important centers of health, and these in turn are subject to infective, toxic and mechanical factors which control the vitality,

health and morbidity of the individual. Light, heat, massage, manipulation and electrosurgical procedures have been found to play an important rôle in the health equation of the individual. The value of these agencies to oral disease has already been demonstrated on a scale sufficiently large and intriguing to call for its recognition under organized and orthodox auspices.

The purposes and desirability of the foregoing section are manifold. It will stiflle and discourage the possibility of new cults to thrive in anarchistic, unethical competition with organized and scientific bodies. Under its own intelligent and regulated supervision it will have full autonomy to develop, contribute and evaluate physical procedures in relation to oral practice. It could well act as a *liaison* between Physical Medicine and Dental and Oral Surgery. It could contribute as an advisory body toward the shaping of respective curriculums of various teaching institutions throughout the land. Its mission and purposes could indeed be so vital as to redound to the credit of contemporary medicine.

The Congress as a whole welcomes this section into its midst and offers it similar rights, privileges, opportunities and full cooperation as that which she has given to other sections. The Congress has great respect and full confidence in the officers of its selection. It feels that a vital facet has been incorporated in physical therapeutics with potentialities for great good to mankind. The following individuals have been elected as officers for the ensuing year:

Alfred J. Asgis, D.D.S., F.A.S.S.. New York, Chairman.

Harry M. Moss, D.D.S., New York, Secretary.

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Daily Broadcasting Schedule During Eleventh Annual Session of American Congress of Physical Therapy at New York

SEPTEMBER 6th

Station WABC — Columbia Broadcasting System — 4:30 to 4:45 p. m. Dr. Grant E. Ward, Associate in Clinical Surgery, Johns Hopkins University Medical School — "Electrosurgery."

Station WEAF — National Broadcasting System — 2:30 to 2:45 p. m. Dr. William Bierman, Director of the Department of Physical Therapy, Beth Israel Hospital, New York — "The Use of Electricity in Medicine."

Station WINS — 9:30 to 9:45 a. m. Dr. Richard Kovacs, Clinical Professor of Physical Therapy, Polyclinic Medical School and Hospital — "Physical Forces in Healing."

SEPTEMBER 7th

Station WABC — Columbia Broadcasting System — 4:15 to 4:30 p. m. Dr. F. Howard Humphris, British Delegate to the American Congress of Physical Therapy. "The Use and Abuse of Electricity in Medicine." Announcement by Dr. Norman E. Titus, Director of Physical Therapy, Columbia-Presbyterian Medical Center.

Station WEAF — National Broadcasting System — 2:00 to 2:15 p. m. Dr. John S. Hibben, Secretary of the Pacific Coast Physical Therapy Association — "The Use of Light in the Treatment of Disease."

Station WJZ — National Broadcasting System — 4:30 to 4:45 p. m. Dr. Edgar Mayer, Medical Director of the N. V. A. Sanatorium, Saranac Lake, N. Y. — "Physical Therapy in Tuberculosis."

Station WOR — 11:00 to 11:15 a. m. Dr. Frank Krusen, Associate Dean, Temple University School of Medicine, Philadelphia, Pa. — "Influence of Sunlight and Posture on Health."

Station WNYC — 11:20 to 11:30 a. m. Dr. Ira I. Kaplan, Director, Division of Cancer, Department of Hospitals, New York. — "Cancer Treatment in New York Hospitals."

SEPTEMBER 8th

Station WABC — Columbia Broadcasting System — 4:45 to 5:00 p. m. — Dr. Max Thorek, Surgeon-in-Chief, American Hospital in Chicago — "Physical Therapy in the Treatment of Cancer."

Station WINS — 9:30 to 9:45 a. m. Dr. Norman E. Titus, Director of Physical Therapy, Columbia-Presbyterian Medical Center — "What Is Physical Therapy?"

SEPTEMBER 9th

Station WABC — Columbia Broadcasting System — 4:30 to 4:45 p. m. Dr. Clay Ray Murray, Associate Professor of Surgery, College of Physicians and Surgeons, Columbia University — "Physical Therapy in the Treatment of Injury."

Station WINS — 9:30 to 9:45 a. m. Dr. Victor E. Levine, Professor of Bio-Chemistry and Nutrition, Creighton University School of Medicine, Omaha, Nebr. — "Sunlight and Its Many Values."

CURRENT NEWS AND SCIENCE

Annual Meeting
American Academy of Physical Therapy

The American Academy of Physical Therapy will hold its annual meeting at the Hotel Walton in Philadelphia on October 12, 13 and 14, 1932. Besides the program of scientific papers, clinics will be at the various hospitals. There will be a manufacturers' exhibit.

Pregnancy and X-Rays — Collected Report

Dr. P. Murphy (*Amer. Jr. Obstetrics,* Vol. 18): As nowadays x-ray therapy is recommended for so many diseases, the question of injury of the vaginal vault and the fœtus by the roentgen rays is of great importance. Some recent works on the subject have been submitted. The author has collected reports on 625 women who were irradiated shortly before or during pregnancy. In 25 per cent of the cases abortus occurred. With 402 full term pregnancies with irradiation before the beginning of gravidity no certain injury to the fœtus could be proved (other authors sometimes found injuries — the Ed.). With 74 full term pregnancies irradiation took place during that period. One-third of these children showed malformations, usually microcephalia, more rarely hydrocephalus, mongoloid idiocy (once after diagnostic x-ray irradiation), blindness, clubfoot, etc. (according to Gauss x-ray irradiation of pregnant women in 44 per cent of the cases causes an injury to the fœtus. — The Ed.). We would therefore warn most emphatically against the irradiation of pregnant women. The author even goes the length of advising — if an x-ray irradiation should be necessary, and doubts concerning a possible pregnancy should exist, first to make a curettage and should pregnancy have been overlooked to interrupt it again.

L. Goldstein and P. Murphy (*Amer. Journ. Obstetrics,* Vol. 8): Report on a pregnant patient aged 28 who suffered from carcinoma of the cervix. The tumor was removed by cauterization; after-treatment with radium. The woman gave birth to a premature child of 300 gm. weight which under further observation showed microcephalus idiocy.

H. Naujoks, (*Strahlentherapie,* Vol. 37, No. 3). Examination of six children at the University Women's clinic at Marburg, whose mothers before the pregnancy in question had been amenorrhoic for some time because of x-ray irradiation. One of the children was undeveloped physically and mentally, one suffered from adiposity, but these symptoms need not necessarily be due to x-ray treatment injuries. The question of injuries to progeny by x-rays requires further extensive observation of such children, through some central hospital. (We can today, as one knows, by suitable exactly dosed x-ray irradiation render any woman amenhorroic for some time, that is, sterilize her temporarily. This is no doubt very important for tubercular diseases and other maladies. The duration of amenorrhœa thus obtained is from half a year to three years. But the question is not yet decided with any certainty whether any possible later progeny may be injured thereby. A further risk lies in the fact that sometimes, in spite of the correct dosage, permanent amenorrohœa occurs; with women over 37 this is frequently the case. — The Ed.).

The German Society for Genetics and Eugenics, at its meeting in September, 1931, in Munich, passed the following resolution: "The injuries of progeny through x-rays has been proved by a number of exact experiments. It is a question of injuries of progeny which sometimes may only evince themselves after generations. We would therefore point out to physicians most emphatically the danger which threatens progeny through the x-ray irradiation of the genital glands." — *Ars. Medici,* March, 1932.

Diathermy in Subdeltoid Bursitis

The following discussion is taken from "Hospital Staff Transactions" (Vicksburg Sanitarium and Crawford Street Hospital) of the *New Orleans Med. and Surg. Jour.,* February, 1932:

Abstract: Subdeltoid Bursitis.—Dr. A. Street.

Patient.—White, female, aged 25, single.

Present Complaint.—Pain in right shoulder

for past two days; impossible to raise arm on account of pain; some fever, anorexia and nausea.

History.—She fell on the right arm three months ago but did not strike shoulder. Recovery from this injury seemed to be complete. Tonsils had been removed. History otherwise not remarkable.

Physical Examination.—Not remarkable except for swelling of right deltoid region, painful motion of shoulder and tenderness of shoulder. Temperature 100 deg. F.

Blood and urine examinations showed nothing abnormal.

Roentgenogram of shoulder showed calcification in the right subdeltoid bursa.

Treatment.—At first consisted of giving salicylates and intravenous mercurochome. There was no improvement. The patient was then admitted to hospital and given 40 minutes of diathermy through the shoulder daily for three days. After the third day symptoms had entirely disappeared.

X-Rays and a Camera

A combination of x-rays and a tiny camera which is lowered into the stomach now gives the physician or surgeon a means of determining more exactly the location of ulcers or other lesions in the stomach, Dr. P. E. Thal, of Chicago, told members of the Radiological Society of North America at their meeting in St. Louis. The camera consists really of two cameras, one above and one below an illuminating bulb, Dr. Thal explained. The whole arrangement is small enough to be passed into the stomach easily. A flexible tube from the camera carries the manipulating mechanism. Each camera has four film chambers arranged so that tiny photographs are made of four sides of the stomach walls. Thus eight pictures may be made at one time, covering the entire interior area of the stomach. By means of the x-ray, the physician can see the camera in the stomach and guide it to the best place to take the pictures. When all is ready the exposure is made by opening the shutter and flashing the light. The films are treated like any other photographic negatives. The resulting pictures tell the surgeon just where he may except to find the ulcer he wishes to remove at operation.—(*Science*, December 4, 1931.)

Starlight Can Be Stored and Ultraviolet Metered!

Light from the star Arcturus can be used as the motive power for opening the 1933 Chicago World's Fair, even if the opening night is cloudy.

This assurance was given to exposition officials by Dr. Harvey C. Rentschler, research director of the Westinghouse Lamp Company.

The light can be captured on a clear night, he said, and kept in cold storage until wanted. The method would be to take the light directly from the star through the Yerkes telescope, trap it by absorption in a phosphorescent substance, and freeze it in liquid air. Then it can be released at will.

Fair officials selected Arcturus because it takes forty years for light to travel from there to the earth — so that a ray which left the star at the opening of the last World's Fair in 1893, will arrive just in time for the new exposition.

Heretofore physicians prescribing sunlamp treatments for the varying needs of patients have been embarrassed by the lack of an accurate device for measuring the dose.

Now there is a "teaspoon," so to speak, for measuring a "dose" of the ultraviolet the doctor ordered.

Dr. Rentschler used a uranium wire, glowing under a correx glass, with a meter which ticks — ticks fast when the current of ultraviolet is great, ticks slow when it diminishes.

With the new dose-meter, plus the doctor's instructions, it is promised that the patient will be able to get the full benefit of the treatment and escape the burns which hitherto have been hard to avoid. — *Ill. Dent. Jour.*, August, 1932.

Dr. Abel of Johns Hopkins Elected New A. A. A. S. Head

Dr. John J. Abel, professor of pharmacology at the Johns Hopkins Medical School, Baltimore, has been elected president of the American Association for the Advancement of Science for 1932. This action was taken at the annual meeting of the Association in New Orleans. Dr. Abel succeeds Dr. Franz Boas, noted anthropologist at Columbia University.

The new president is probably best known for his contributions to knowledge of the chemistry of the internal secretions of the

body. He deserves credit for being the first to obtain in chemically pure form the secretion of the adrenal glands, to which he gave the name epinephrine, also known as adrenalin. Dr. Abel did the fundamental work which led to its isolation, although the Japanese investigator, Jokichi Takamine, was the first to obtain the substance in crystalline form. Dr. Abel was also successful in isolating the hormone of the pituitary gland and was the first to obtain insulin, secretion of the pancreas, in crystalline form. His research has extended to many other subjects. In addition he has been an educator whose students have won distinction in many parts of the world. Dr. Abel recently announced that he would retire from teaching next fall, to devote himself exclusively to research.

He was born in Cleveland in 1857, graduating from the University of Michigan in 1883. He has been honored with degrees, medals and membership in scientific societies both in this country and abroad. He has also founded and edited scientific journals.—*Science News Letter,* January 9, 1932.

Infantile Paralysis Caused by Disappearing Microbe

Important Discovery Leading to Preparation of Serum and Vaccine Which May Result in Stamping Out Disease

The cause of infantile paralysis is an exceedingly minute microbe, roughly one five-hundred-thousandths of an inch in size, which becomes invisible to the most powerful microscopes when it infects the brain and spinal cord and produces the dreaded paralytic symptoms which have killed or shattered the lives of many American children in the past few years. This important discovery, which may lead to the prevention and curing of the disease, has been disclosed to the American Association for the Advancement of Science by Dr. Frederick Eberson of Mount Zion Hospital and University of California Medical School, San Francisco.

The preparation of vaccines from the germ in the hope of developing a practical method of protection against the disease is now in progress, Dr. Eberson announced.

He is also attempting the production of a serum for use in prevention and treatment, but neither of these efforts is yet ready for definite report. Testing upon human patients is still in the future.

By using a specially prepared sterilized food, Dr. Eberson succeeded in making visible microbes appear and grow where only a carefully filtered fluid from the brain and spinal cord of infantile paralysis victims had been planted. Before Dr. Eberson's research, the cause of poliomyelitis, as infantile paralysis is called medically, was attributed to a microbe too small to be seen with any microscope and capable of passing through the pores of the finest screen or filter, minutely grained clay or porcelain. This invisible infectious agent was called a virus. Now Dr. Eberson has shown the Dr. Jekyll and Mr. Hyde character of the germ by making it come out from under its cloak of invisibility.

The special germ food used by Dr. Eberson consisted chiefly of minced sheep brain tissue contained in a veal broth. Into a test tube of this material he placed a very small amount of filtered substance from the brain and spinal cord of monkeys ill with the disease. This test tube culture developed the very small but visible germ after it had been kept at the temperature of the human body for several weeks. By transferring a tiny drop of the growth in one tube to another, he kept the disease strain alive and saw it multiply greatly.

The crucial test was when Dr. Eberson infected monkeys with the visible germs, saw them develop poliomyelitis in typical severity and then grew the visible germs from the invisible organisms in the fluids of their diseased nervous system.

The discovery of the cycle of infantile paralysis and the demonstration of both invisible and visible stages of the germ's life is considered important to the future conquests of other diseases like colds, influenza, encephalitis, etc., now attributed to invisible germs.

The poliomyelitis germ discovered by Dr. Eberson ranged in size from the lowest limit of visibility to about a tenth of a micron. The germ has a sheath-like surrounding envelope that causes it to group with others to form clumps.—*Science News Letter,* January 9, 1932.

New Fundamental Life Question Raised at Meeting by Proof That Nerves Travel From Spine to Destination

Science must now set about answering a fundamental question of life, why nerves grow with seeming intelligence and purpose, as a result of researches by Dr. Carl Caskey

Speidel, University of Virginia anatomist, who presented the $1,000 prize paper before the American Association for the Advancement of Science annual meeting at New Orleans.

Living, growing nerves of the tadpole were seen by Dr. Speidel to sprout from the spinal cord and, like a telephone wire being strung from a central office to a home, to go directly to the muscle or sense organ they were destined to connect with the central nervous system.

With his microscopic observations which revealed the growth of nerves in the living body for the first time, Dr. Speidel settled conclusively a controversy in neurology that has raged since 1860, when the German biologist, Wilhelm His, suggested that nerves grow outward just as Dr. Speidel finds they actually do. The opposing theory was that nerves grew by the connecting up of cells already existing in the region between the central nervous system and the part of the body to be controlled by the nerve.

But out of his success there will arise, as is often the case in science, a still more difficult question: How does the nerve know how to travel unerringly to its destination?

Thus the door is held open to some uncomprehended commanding purpose, which some will call a manifestation of some sort of god, to rule the course of the growth of living things.

Use of a special, dark field illumination microscope enabled Dr. Speidel actually to follow the growth of the nerves from minute to minute over a period of several weeks. Some of the tadpole nerves grew at rather astonishing rates for short periods. One traveled for ten minutes at the rate of one micron per minute, a distance that is about one five-hundredth of the width of the mark of a soft lead pencil.

The nerve traveled outward on its important journey much as though it were a whole animal in itself, a sort of very intelligent worm bent on getting where it should go.

While nerve action may be electrical in its nature, Dr. Speidel's work also successfully destroyed the idea that nerve growth is controlled by an electrical field in the body. He saw two nerves prolonging themselves along the same route in opposite directions, which would be impossible if they were controlled by an electric field.

Unlike a telephone line, nerves cannot be patched when cut, but the break must be remedied by an entirely new outgrowth from the place of the cut to the muscle or sense organ controlled. It is just as though a telephone lineman were unable to use any of the old wire between the place of a break in the line and the subscriber's telephone and had to string entirely new wire.

This explains why, when a finger or leg suffers a serious cut, it may take weeks and months for normal feeling to be restored in it, and why muscles have to be entirely re-educated.

Dr. Speidel, who is honored with the prized thousand-dollar award for a notable paper out of the more than a thousand read at the meeting, is only 38 years old. He has worked on his problem for a number of years. He was born in Washington, D. C., did his undergraduate work at Lafayette College, Pennsylvania, and took his Ph.D. at Princeton in 1918. His researches in detailed form will be published in a forthcoming issue of the *Journal of Experimental Zoology.* — *Science News Letter,* January 9, 1932.

A new understanding of the important effects which climate has on the health and body machinery of human beings was described by Dr. Clarence A. Mills of the University of Cincinnati College of Medicine at the meeting of the American Society of Tropical Medicine in New Orleans, November 18 to 20.

Although the stimulating climate of the northern and northwestern parts of the United States is popularly considered more healthful than the sluggish, semitropical climate of the South, Dr. Mills found that in some regions the climate appears to have too stimulating an effect on certain bodily processes and that the death rates from certain diseases, such as diabetes, exophthalmic goiter and Addison's disease, were higher. His theory is that in such regions the drive of the stimulating climate forces an increasing number of people to live at such a fast pace that their body machinery breaks down. Suicides, the effect of mental breakdowns, he also found to be most frequent where the climate is too stimulating. He advised that cases of mental or bodily breakdown should be sent south for treatment when possible, so that they might have the benefit of the lessened vigor of the climatic drive.—(*The J. of the Missouri M. A.,* Feb., 1932.)

THE STUDENT'S LIBRARY

ATLAS CHIRURGISCH-PATHOLOGISCHER RÖNTGENBILDER (Lehmann's Mediznische Atlanten Band VI). By Professor *Dr. Rudolph Grashey,* Direktor des Röntgen-u. Licht-Instituts der Universität Köln. Third and enlarged edition. Cloth. Pp. 253, with 635 special and 184 schematic illustrations in text. Price, RM.30. Munich: J. F. Lehmann, 1931.

Only on rare occasions is one confronted with a work whose perfection comes so close to the ideal as to leave one mentally stranded for the want of concise expression to render it proper justice. The volume before us embodies such an extraordinary degree of scholarly labor in the field of roentgenologic studies as to make one pause for the exact word to describe its rare worth. Written by an authority world famous for his high scholarship and rare editorial ability in the field of x-ray work, the book reaches the superlative height of balanced perfection in scholarly orientation and artistry of roentgenographic illustration seldom encountered elsewhere in any other language. Professor Grashey has divided his text into two sections. The first portion concerns itself with a didactic discussion of practical problems experienced by radiologists in private or institutional practice. The topics covered in this section and illustrated here by schematic drawings are as follows: (1) Foreign Bodies; (2) Concretions; (3) Diseases of Bone; (4) Diseases of Joints; (5) Deformities; (6) Tumors; (7) Pathologic Changes in Soft Tissues; (8) Luxation and Distortion; (8) Fractures.

The second half of the book which is by far the most voluminous portion of this work, has embodied as its text exquisite roentgenograms of actual histories illustrating the various findings which may be encountered in the foregoing classification. The photographic work follows the technic of Groedel which is of a highly glazed order and gives to the picture a depth and perspective superior to the flat photography universally encountered in x-ray work. This contribution contains so many facets of scholarly and artistic workmanship that its study becomes a delight and an inspiration. The radiologist not possessing this work misses an extraordinary guide and neglects an educational opportunity of no small order. The book is highly recommended.

THE DIAGNOSIS AND TREATMENT OF BRAIN TUMORS. By *Ernest Sachs,* A.B., M.D., Professor of Clinical Neurological Surgery, Washington University School of Medicine, St. Louis. Cloth. 396 pp. 224 illustrations, including ten in colors. Price: $10.00. St. Louis: C. V. Mosby Co., 1932.

One of the marked advances in medicine during the past decade is the management of brain tumors. Recent medical graduates are taught the essential facts concerning this very important subject, and, in this respect, secure a broader comprehension of neurological surgery than the older students of medicine. It is quite well known that neurological surgery, as a specialty, has achieved its greatest development in America. It is still making progress, even in greater strides now than before, and probably for this reason it has attracted more of the younger generation of physicians to take up this newer study.

The need for a suitable text dealing with the various aspects of the subject is answered by the present volume. The author whose experience extends over a period of years was well qualified for the undertaking.

One should not understand that brain tumors constitute the entire number of cases belonging to the field of neurosurgery. The subject is broader than this — but brain tumors occur with relative frequency, and inasmuch as every physician may expect to encounter them he should know how to recognize them. In other words the diagnosis of brain tumors is equally as important as the treatment. The author has taken cognizance of this and has made ample provision for a study of this phase of the subject.

There are nine chapters in all. Surgical anatomy, physiology and surgical pathology are adequately covered to form the basis of the work. Methods of examination as pursued by the neurologic surgeon are likewise fully discussed. The general symptoms and signs of increased intracranial pressure, the study of cerebral tumors and tumors of the cerebellum, pons and medulla comprise other chapters of importance. Recent studies with reference to diseases of the pituitary gland prompted a chapter on this subject. The closing two chapters deal with differential diagnosis and operative treatment. 218 illustrations and 6 colored plates make this volume a most complete one.

The neurologic surgeon has come to appreciate the value of the electrosurgical unit and now includes it in his operating room equipment. The author has found numerous uses for the coagulation technique, and, in fact, openly expresses a preference for it for certain purposes. This is indeed commendable and demonstrates that every new advance has received careful consideration.

The reviewer wishes to express his personal good word for the wealth of material included in this text. Aside from the fact that the subject has been covered in great detail, the style of presentation, the illustrations, and the mechanical make-up easily make it the outstanding volume dealing with the diagnosis and treatment of brain tumors. It merits appreciation from the general physician and specialist alike.

DEEP X-RAY THERAPY IN MALIGNANT DISEASE. A Report of an Investigation Carried Out from 1924-1929, Under the Direction of the St. Bartholomew's Hospital Cancer Research Com-

mittee. By *Walter M. Levitt,* M.B., D.M.R.E. Introduction by *Sir Thomas Horder,* Bart., M.D., F.R.C.P., Chairman of the Cancer Research Committee. Cloth. Pp. 128 with illustrations. Price, 10s. 6d. net. London: John Murray, 1930.

As a result of the visit of certain members of the medical staff of the St. Bartholomew Hospital to Erlangen in 1921, to investigate the claims which were being made for deep x-ray therapy in the treatment of cancer, the foregoing hospital decided to carry out an investigation of the effect of deep x-ray therapy in conditions similar to those favorably reported by the Erlangen Clinic. A radiotherapeutic research committee, headed by Sir Thomas Horder was appointed, the function of which was largely stimulated by the generous financial support obtained by Dr. Donaldson through friends, and the associated financial assistance of the British Empire Cancer Campaign. The study was restricted to four groups, the types of cases to correspond to those in which research on radium was being carried out. The present work is a report of the experience obtained by means of this investigation of the effect of deep radiation therapy and, according to the opinion of Sir Thomas Horder, "Brings our knowledge upon the whole subject of deep x-ray therapy in cancer to a state of precision not hitherto attained in this country, and may prove to be of great value as a standard in this matter for some little time to come."

The present report is divided into nine chapters and an index, and evaluates the broad experiences obtained by the separate investigators of this committee in the treatment of the following cancer groups: (1) Malignant diseases of the breast; (2) the uterus; (3) the upper air passages; (4) the esophagus. To these were subsequently added, studies of rectal malignancies and the thyroid gland. The discussion is rich in detail as well as broad in its suggestive possibilities. It also includes a comparative analysis of the effects when x-ray and radium are combined in treatment.

The author's observations tend to indicate that combined irradiation, "so far as they go, appear to be distinctly better than those treated by x-ray alone." A conviction is left with the reader that by these means, the power of inflicting serious damage to the cancer cells may be of the nature produced by a summation effect from the respective radiations utilized. The conclusions arrived at, although held tentatively, because of the short duration of the time elapsed, contains at the same time certain convictions of interest to all students of the cancer problem. It was shown that malignant growths, even when advanced, may be made to disappear by x-ray treatment. It was found that cancer cases in different situations react differently to treatment, the most favorable sites being the upper air passages, uterus and breast, as compared to the rectum and esophagus. The risk was found to be small and the discomfort negligible. Experience moreover suggested that combination of x-ray and radium is perhaps superior than when either of these methods are used alone. This book is recommended to all earnest students in this field of therapeutics.

VARICOSE VEINS. With Special References to the Injection Treatment. By *H. O. McPheeters,* M.D., F.A.C.S., Director of the Varicose Vein and Ulcer Clinic, Minneapolis General Hospital, etc. Third Edition. Cloth. Price $4.00. Pp. 285 with 62 half-tone illustrations and line engravings. Philadelphia: F. A. Davis Company, 1931.

The present work is the third edition of an eminently successful discussion on the non-surgical treatment of varicose veins. The author calls attention that the foregoing "compilation is a résumé of a most thorough investigation of the literature throughout the world — wherever this work has been done — combined with the care of approximately 2000 cases actually treated." In the revision of the present text many changes have been introduced, based upon the wider knowledge and experience resulting from the study of this malady. New methods are advocated, new technics are stressed, and new or additional material is incorporated in various portions of the text. A new chapter has been added which deals with "The Causes of Failure in the Injection Treatment of Varicose Veins." Discussions have been added to Chapter XXV dealing with Elephantiases, namely, the "Elephantoid States Due to Lymphatic Obstruction." Chapter IV reports experiments with new technic and comparative studies of the blood pressure in the varices and the deep femoral vein by means of lipiodol.

The work now assumes the dignity of a well rounded treatise on the non-surgical management of varicose veins. It summarizes the rationale of this treatment, its technic, methods, medicaments and the literature on the subject. Appended to the book is a generous bibliography besides that of an extensive reference. It should also be noted as a matter of satisfaction that the quality of the work has been greatly enhanced by the clear type and the beautiful illustrations. Altogether, the work is an index of fine orientation on the part of the author and well worth the cost of investment to all practitioners of medicine.

THE PRACTICAL MEDICINE SERIES COMPRISING EIGHT VOLUMES ON THE YEAR'S PROGRESS IN MEDICINE AND SURGERY: GENERAL MEDICINE. Edited by *George H. Weaver,* M.D., *Lawrason Brown,* M.D., *George R. Minot,* M.D., *William B. Castle,* M.D., *William D. Stroud,* M.D., *Ralph C. Brown,* M.D., Series 1931. Pp. 814 with illustrations. Price $2.25. Chicago: The Year Book Publishers, 1931.

It is unfortunate that the individual is so constituted that he is prone to lose interest in things constantly repeated. A case in point is the yearly issuance of the Practical Medical Series exemplifying as much a labor of love as it has proven a labor of great practical value. No progressive physician can keep abreast of all of the new thoughts, contributions and theories in the realm of his special field of endeavor without the costly investment of time, energy and periodicals to digest the essentials contained therein. General medicine with its editorial staff of authorities in the special subjects listed offers the medical profession a service

of the highest order by means of the selected and digested information contributed recently in various sections of the world. This volume in proportion to its increasing popularity has gradually grown in size. The present volume is of "hefty" proportion, separated into five parts, each presenting a special division in medical practice: (1) Infectious Disease; (2) Diseases of the Chest; (3) Diseases of the Blood and Blood-Making Organs; (4) Diseases of the Heart and Blood Vessels; (5) Diseases of the Gastro-Intestinal Tract. There is appended a complete index of subjects and an index to authors. To enumerate the many interesting and practical suggestions with which this book is replete would occupy many pages. No serious minded or progressive physician would do without it, knowing the treasure house of information that is incorporated in its pages. We highly recommend it as a necessary book to all medical practitioners.

THE FINE ART OF LIVING. A Practical Guide to Well-Being Through Proper Eating, Thinking and Living; A Symposium on the Preservation of Health and the Prevention of Diseases in the Light of Modern Science. By *Daniel S. Soper,* M.D. Cloth. Price $2.00. Pp. 205. Philadelphia: Dorrance and Company, Inc., 1932.

Undoubtedly the subject of the fine art of living is now creating more diversified channels of thought than perhaps any other subject. Opinions are becoming more unified regarding food values, exercise, hygiene and preventive medicine than ever before in the history of civilization. The present volume tells informally and in language divested of technical expression, the *modus operandi* of how to attain health, how to reach old age in a healthy physical and mental state. The subjects considered in these pages, therefore, cover a wide range of facts. The author has incorporated discussions on the nature of a balanced diet, which includes evaluations of vitamins, raw foods, meats, fruits, nuts, cereals, vegetables, milk and milk products; infant diets; reducing diets; breathing and bathing; disease prevention; the outdoor life, fasting, medicine and its place; mental culture; indigestion, constipation and appendicitis and points to the way of living — the art — which will raise the life expectancy of the race to 100 years plus.

One finds in these pages much that is radical in point of view; indeed, there is much here that will appeal to the conservative element as revolutionary, or *quasi* scientific. The author has often drawn inspiration from mixed sources — ancient, metaphysical and scientific. He reasons that because the ancients were given to bathing (Romans and Greeks) that it is a great factor in promoting health and longevity. This is sophistry because the ancients as a whole were hygienically less fastidious as regards bathing, and their life's span in spite of Roman bathing establishments was less than ours. As regards vegetarian diets being more conducive to health, his arguments are equally unconvincing, though perhaps interesting in point of view. It is pointed out that animals eat grass and are herbivorous. They wax strong, big, and stupid on this form of diet. It may also be pointed out that hogs eat dung and other effete material and become fat on it. Fowls insist on a diet full of worm-like delicacies and ground refuse. The argument that we should revert to a vegetarian or a mixed primitive diet because animals seem to thrive on it, is to say the least, rather unconvincing, although the author marshals many facts in defense of a return to Nature and simple living, he advances many arguments of a borderline scientific type. The book, however, is not altogether devoid of a practical and sensible attitude in regard to the major premise, the fine art of living. It is chuck-full of information of interest to lay people.

PRACTICAL PHYSICAL CHEMISTRY. By *Alexander Findlay,* M.A., D.Sc., Professor of Chemistry, University of Aberdeen, Fifth Edition. Cloth. Pp. 312. Price $2.25. London and New York: Longmans, Green and Co., 1931.

The study of physical chemistry once regarded as the "calculus" of chemistry has gradually come to be more popularly considered because of its practical need in industry and now in the biologic sciences. Although its relationship to our daily medical problems has rarely been distinguished, its teachings are now incorporated in the study of organic phenomena, physiology, and more recently into clinical medicine. Physical therapy teaching will find in this section of chemistry a source of inspirational influence very rarely exploited in the past but one that promises to occupy many hours in its future curriculum. The inter-relation of energy and its modes of transformation is a subject of great importance for our better understanding of the action of the various agents now employed for therapeutic purposes. The physician practicing physical therapy should have an understanding of the changes that organic structure undergo in the presence of energy transmutation, be it heat, light, electricity, or mechanics. The explanation and demonstration of such changes is in the province of physical chemistry. For example, it explains the rationale of viscosity and surface tension, colloid phenomena, optical measurements, conductivity of electrolytes, measurements of electromotive force, velocity of chemical reaction, and thermo-chemistry.

The present volume, written by an authority on the subject, has recently been revised and enlarged. It has undergone thirteen reprintings and is now in its fifth edition. The text is a concise discussion of various subjects listed under physical chemistry. Some of the new material and experiments which the author has incorporated are: Vapor pressure of liquids, gaseous dissociation, potentiometric measurements, and indications for the determination of hydrogen ion concentration. The study of this book represents the same importance to modern medicine as the appreciation of the basement structures to the architect or engineer. We recommend this book because it offers the medical student a broader appreciation of the problems that daily confronts him in practice.

INTERNATIONAL ABSTRACTS

The Fixation of Calcium. Dr. Lecrenier.

Oral Hygiene, **22**:1152, June, 1932.

The article is a review of a paper by that title presented before the French Congress of Medicine in Liege, by Drs. L. Brull, G. Mouriquand and A. Leulier. Attention is called to the important rôle that calcium plays as regulator of nervous and neuro-muscular reactions; the tone of smooth and striped muscles; of cellular permeability; coagulation of proteins, and very likely immunity.

According to these authors 99 per cent of the calcium content of the body can be found in the skeleton and only one per cent of the total calcium in the non-osseus tissues. It is assumed that normally the calcium requirements of the body are more than supplied by ordinary diets. The question of fixation, then, is the all important one.

For the assimilation of calcium, the first requisite is the solubility of the calcium salts which is normally taken care of by the process of digestion. The activating factors which enter into the process of fixation are Vitamin D and the parathyroids.

After giving the results of laboratory experiments the significant statement is made that "of the numerous medications which, in the course of centuries, have been advocated against rickets, two only seem to have stood the long test: cod-liver oil, and sunlight."

It is noted that the exposure of many substances to ultraviolet rays activate them as calcium fixators, but a warning note is sounded against indiscriminate or careless use of such potent activators as irradiated ergosterol.

The author of the review submitted to Drs. Fargin-Fayolle and Rousseau-Decelle, dentists to the hospitals of Paris, the following question: "Do you believe that it is possible to enhance, by medical means, the fixation of calcium in the teeth?" Dr. Fargin-Fayolle in his reply believes: "It is possible that the calcium may become fixed during the active period of tooth formation, but not later on in life." He cautions against standardizing of treatments with irradiated ergosterol, believing that each case is a law unto itself.

Dr. Rousseau-Decelle believes that therapeutic measures may favor calcium fixation but only under "certain conditions," and calls attention to the part played by the sympathetic nervous system and the endocrines. He calls attention to the value of the vitamins, ultraviolet rays, etc., in the assimilation and fixation of calcium.

The Diagnosis and Treatment of Major Infections of the Hand. Sumner L. Koch.

Minn. Med., **15**:1 (January) 1932.

The major infections of the hand — acute lymphangitis, infections of the tendon sheaths and infections of the fascial spaces of the palm, present definite and unmistakable diagnostic criteria.

Lymphatic infections should be treated conservatively and operated upon only when there are unequivocal signs of pus formation. Infections of the tendon sheaths and fascial spaces of the palm should be drained carefully and adequately as soon as the diagnosis is made.

In the post-operative care of hand infections the prevention of secondary infection, early mobilization and the maintenance of the hand in the position of function during the period of enforced immobilization are important details of treatment.

As soon as the acute symptoms have subsided, usually at the end of three or four days, an arm bath, used for fifteen or twenty minutes twice daily, is substituted for the continuous moist dressing. After being soaked in a warm, sterile solution the arm is laid on a sterile towel, allowed to dry for a half hour under an electric light and covered with a dry dressing. While the hand is in the bath the patient is urged to move his fingers gently to prevent the formation of fibrous adhesions Simply moving the fingers through their complete range of motion once or twice daily during the period of forced immobilization suffices to prevent the formation of crippling adhesions. In addition to the dry dressing a light aluminum splint is applied to maintain the hand and the fingers in the position of function. As soon as the danger of lighting up the infection has passed, physical therapy and active exercises are begun so that restoration of function may keep pace with the healing of the tissues.

Electrophoresis Experiments with the Virus and Protective Bodies of Yellow Fever. Martin Frobisher, Jr.

Jour. Exper. Med., **54**:733 (November) 1931.

The following conclusions are presented by the author:

1. When suspended in slightly alkaline (pH 7.4 to 7.8) saline dilutions of clear, hemoglobin-free normal monkey serum, the virus of yellow fever from infected monkeys and from infected, but blood-free, mosquitoes, usually acts as if it were possessed of a positive electrical charge.

2. The virus tends to assume a negative charge in fluids having a slightly acid reaction.

3. The isoelectric point of the virus seems to be in the neighborhood of pH 7.0, possibly ranging from pH 7.3 to pH 6.9.

4. Exposure to fluid having a reaction of pH 5.0 for 3 hours appeared to inactivate the virus.

5. In experiments in which the suspending fluid was prepared with normal serum diluted with distilled water and containing a good quantity ot partly hemolyzed erythrocytes, the virus tended to migrate to the anode.

6. The protective bodies in yellow fever im-

mune serum appear to carry a negative charge in slightly alkaline saline dilutions of serum.

Indirect Application of Roentgen Rays in the Treatment of Alopecia Areata. Giovanni Truffi.
Ann. de dermat. et syph., **2**:684 (June) 1931.

Eight patients with alopecia areata were treated by means of roentgen rays applied over the cervical spine. Six patients responded, with total regrowth of hair. The other two did not respond. The author contends that these two failures do not invalidate the efficacy of the method; they merely show that it is not applicable to all cases, which is likewise true of other methods, such as sympathectomy. The mode of action is probably the same as that of sympathectomy, namely, the provoking of a vasodilatation and stimulation of regenerative processes. The regrowth of hair is stimulated only in the region corresponding to the territory of innervation of the zone irradiated.

Report of a Case of Abnormal Fetus Following Radiation of the Mother. Ira I. Kaplan.
Am. Jr. of Obst. and Gyne., **23**:426, (April), 1932.

A stillborn hydrocephalic monster having distorted atrophic features, rudimentary nares, body well developed, and with extreme polyhydrannios was delivered about nine months after therapeutic irradiation. The mother, 27 years, was subject to irregular menstrual periods and was being treated for this and sterility. The physician, a gynecologist, and the patient were both unaware of an existing pregnancy at the time of the irradiation. In view of the relative frequency of monstrosities occurring in non-irradiated patients, and the occurrence of normal babies in therapeutically x-rayed mothers, Kaplan's view is that the x-radiation was not the prime factor in production of the monstrosity.

The Orthopedic Treatment of Anterior Poliomyelitis at the Acute and Convalescent Stages. Samuel W. Boorstein.
Med. Jour. and Record, **125**:27 (January 6) 1932.

Previous epidemics have shown us that cases of anterior poliomyelitis develop marked deformities which are worse than the original afflictions. These deformities are due to: 1, muscle unbalance; 2, tissue contraction; 3, habitual posture; 4, static influence, and 5, gravity.

For restoration of function, physical therapeutics used are: 1, massage; 2, heat; 3, muscle training or muscle re-education; 4, heliotherapy; 5, hydrotherapy, and 6, electricity.

Massage is not a cure for anterior poliomyelitis. If properly performed, that is, by gentle striking and kneading, it stimulates the local circulation of the muscles. It, therefore, retards the local atrophy. If the massage is done roughly, or for more than a few moments at a time, the result, on the contrary, will be to cause atrophy and diminish the muscular tone. In paralysis of abdominal muscles, the massage will naturaliy help to increase the peristaltic action of the stomach and intestines.

The only proper massage is that which is administered by hand; instruments for mechanical massage are of doubtful value, and perhaps, even harmful. The normal massage should be given dry, that is, no oil or coca butter should be used. It should be given daily for ten to fifteen minutes. In clinics, we are accustomed to give patients massage three times a week. Massage is frequently administered after application of heat.

Paralyzed muscles function better while warm. Heat is best applied either as radiant heat by the electric bakers with or without bulbs or alpine lamp. If the application of heat is done just before the massage, the dilated superficial capillaries are full of blood, hence the massage is more effective, more venous blood is sent to the heart and more is returned to the limb. As warmth is so necessary for the paralyzed limbs, the patient should be protected against cold by wearing additional clothing.

Muscle training is the natural form of re-education of weak muscles. It should take the form of carefully supervised exercises and is the most important part of the physical therapy. By selecting the particular exercises for the affected group, the muscle trainer attempts to strengthen the affected muscle, and also the remaining strong group which has to take the part of the paralyzed muscle. An attempt is also made to increase and perfect any remaining power in the weakened muscles to such a degree that the muscles will be able to accomplish their movement with nearly normal ability. It is, therefore, important for the muscle trainer to get a definite prescription from the surgeon as to which muscles are affected, and the degree of paralysis. The prescribed exercises should be given daily, but not for long periods — the patient is not to be fatigued. Many are now advocating the use of these exercises while the children are in the bath tub.

It is important to have the co-operation of the child, so that when possible the motions should be performed voluntarily. Ordinarily, this is easily done with a child over two years of age. In children under two, passive motions have to be resorted to, but the spirit of play can be invoked. By tickling or pinching the sole or dorsum of foot, the supervisor can make the child draw his foot upward and downward. Many children at the age of thirteen to fourteen months can appreciate such words of command as up or down, in or out. Frequently the ingenuity of the mother helps.

Exposure to the sun is very beneficial. It increases the skin nutrition and has a general good effect in increasing the tone of the muscles. Of course, exposure should be so regulated as not to burn the patient. If plaster casts are on, each half can be removed when that side is exposed. When exposure to the sun is impossible, one may resort to the quartz lamp. Here again the exposure should be regulated, starting with thirty seconds and increasing it gradually to fifteen minutes.

The use of warm baths in the acute stage, also before massage and exercises, has already been discussed. A rather recent development is the therapeutic pool or underwater gymnasium. It consists of a specially constructed pool with apparatus, under the supervision of technicians, who see that the

child does not use the strong muscles instead of developing the weak ones. One can use salt water or plain water (temperature 90-92 degrees F.). While in the pool, the children are suspended in a harness fastened to an overhead pulley. They use also submerged plinths and so-called "bubble boats." The pools have an overhead tramrail with an electrically operated hoist, thus heavy, helpless patients can be lowered into the pool mechanically. The water adds a natural stimulus to all movements. It has an excellent tonic and stimulative effect.

The technicians are in the pool with the children, and, while the children float around comfortably in the water, the technicians put them through suitable exercises. Treatments can be commenced as soon as quarantine is over, even before soreness disappears. Baths should be used as an adjunct to regular gymnasium work. Swimming in general is a good exercise for anterior poliomyelitis and it has been made doubly beneficial by these special pools. In many orthopedic hospitals these therapeutic pools have been installed.

The value of electricity in the treatment of anterior poliomyelitis has long been a subject of controversial discussion. There was, at one time, an erroneous impression that electrical currents had some mysterious bodily effect. This was the reason it became so popular. At present it is not used nearly as much as formerly. It is recognized, even by its most earnest advocates, that it is only one of the several measures of treatment. There are many men altogether opposed to the use of electricity. However, to be very open minded, let us say that it can be used in combination with heat and light massage. The limb or part should be supported in the position of physiological rest, each muscle is picked in turn by the electrode and a series of twitches produced. The forms of electricity used by its advocates are: galvanic, faradic and sinusoidal.

To recapitulate: During the convalescent period immediately after the acute stage and approximately during the first two years, we resort to the following: 1. Prevention of deformities by plaster and braces, which are dispensed with as soon as possible. 2. Encouragement of natural exercises by providing apparatus to help proper sitting, standing and walking. 3. Restoration of function of the muscles by the physical therapeutics in the form of massage. heat, muscle training, heliotherapy, hydrotherapy or electricity. — *Rad. Rev.*, August, 1932.

Practical Application of Blood Sedimentation Test in General Medicine: Observations Based on Approximately Five Thousand Patients Over a Period of Six Years. J. W. Cutler.
Am. Jour. Med. Sc., **183**:643 (May) 1932.

Cutler studied the blood sedimentation test in hospital, office and dispensary practice during the past six years with more than 5,000 patients. The test was found to be of distinct diagnostic and prognostic value in diseases characterized by disturbed stability of the blood. In diagnosis the test has two values, first as a diagnostic lead and second as a diagnostic gage. As a diagnostic lead it indicates the presence of serious disease, not infrequently before the disease can be recognized by the usual clinical and laboratory methods. As a gage of the constitutional disturbance produced by the pathologic process, it indicates the intensity of the disease and thus, like fever or pulse rate of blood count, but more exactly, helps to complete the diagnosis in a qualitative sense. As a prognostic index and, similarly, as a guide in treatment, the rate of sedimentation has been shown to be a more accurate and reliable reflection of the real condition of the patient than the usually accepted procedures. It invariably becomes more rapid as the disease progresses, and approaches stability only as the physical condition returns to normal. It is not influenced by psychologic factors and may be the only warning of disaster among promising clinical signs, such as gain in weight and the absence or subsidence of symptoms. In this way it is often the only, or the most accurate, evidence of favorable, or of unfavorable, response to treatment. The test is simple to perform and to interpret and is inexpensive. It is a clinical procedure and can be carried out in the office, in the dispensary or at the bedside. The complete result is available within an hour, and in case of necessity the sedimentation test will give valuable information within the first half hour. Its greatest field of usefulness should be in office and dispensary practice, especially in the latter, where large numbers of patients must often be seen in short periods of time and by men seeking experience. Properly interpreted and used with an open mind, the test should in time become one of the most widely used tests in clinical medicine. Its practical value in any given disease is best studied as a separate problem, and such studies should be undertaken in large numbers so that sufficient data become available in a short period of time. Only in this way will lingering doubts be removed and the sedimentation test firmly established as a valuable addition to the equipment of the physician. — *J. A. M. A.* (July 30) 1932.

Mode of Action of Vitamin D: The "Parathyroid" Theory: Clinical Hypervitaminosis. L. J. Harris.
Lancet, **1**:1031 (May 14) 1932.

Investigation made by Harris on hypervitaminosis have substantiated the theory that the characteristic mode of action of vitamin D is to permit an increased "net absorption" of calcium and/or phosphate from the intestine, tending to raise the level of the blood calcium and/or phosphate: the latter rise automatically brings about increased calcification in sites provided with the "bone" or "calcifying" enzyme, phosphatase. This action is apparent whether the vitamin is fed in suboptimal amounts, in doses approaching the optimum, or in moderate excess. Hypervitaminosis thus stands in logical contrast with rickets (hypovitaminosis or avitaminosis). In the latter there is deficient net absorption of calcium and/or phosphate, hence hypocalcemia and/or hyperphosphatemia, and resulting insufficient calcification; while in hypervitaminosis there is a potential increase in net absorption, hypercalcemia and/or hyperphosphatemia, and excessive calcifica-

tion in sites such as the growing end of the bone, in teeth, and also in certain soft tissues such as the kidney and aorta, which are also richly provided with the "bone" enzyme. The indiscriminate use of parathyroid extract clinically for cases of suspected calcium deficiency is to be deprecated, most definitely in such conditions as infantile tetany, osteomalacia and late rickets; for although it will succeed in raising a low blood calcium, it merely aggravates the underlying metabolic error causing loss of minerals to the body, and still further depleting the already impoverished bones. Vitamin D, on the contrary, rectifies hypocalcemia (or hypophosphatemia) by ensuring an adequate utilization of the food calcium (and/or phosphorus). The ill effects in hypervitaminosis are the same in man as in experimental animals. Clinical experience shows that for the human being the toxic overdose of viosterol is not far removed from the optimal (not "minimal") curative dose. The correct dosage should therefore be strictly adhered to. — *J. A. M. A.* (August 13) 1932.

The Therapeutic Uses of a New Gas — So-Called "Octozone." Richard Fawcitt.

Brit. Jour. Phy. Med., **7**:43 (June) 1932.

The author calls attention to a new therapeutic agent — so-called "Octozone" gas, which has provoked his interest because of its striking effect on a case of ostemyelitis. Since then the effect of this gas has been studied as to its effect of bacteria, its influence on the blood, its diffusion and absorption possibilities and its clinical effect on patients with different pathologic conditions, such as rheumatism, bone infection, furunculosis, varicose ulcers, fibrositis, ulcerative colitis, sciatica (two cases with no results), subphrenic abscess, cystitis, and one case of cancer which has to date shown clinical improvement. The author's conclusions are:

"It will be seen from these few observations that the gas, being a powerful oxidizing agent, appears to have a definite use in certain conditions. Oxygen has been used before therapeutically — but this gas is something more than oxygen or ozone and accordingly should have greater possibilities. I have never seen any harm from the administration of the gas (unless accidentally inhaled), not even if a vein is accidentally punctured in giving a hypodermic injection.

"Much of the matter described in this paper would appear to be empirical, but many well-known remedies of today were empirical yesterday, e. g., synthetic drugs, anaesthetics, radium and x-rays.

"My object in writing this paper is to arouse the interest of the profession in a new remedy which may be of great value — and to get the use thereof on a proper professional basis in this country, I sincerely hope that the whole subject will be thoroughly investigated by the large teaching hospitals."

The Kromayer Lamp in the Treatment of Lupus. R. Volk.

Brit. Jour. Phys. Med., **7**:41 (June) 1932.

Volk advocates the superiority of the Kromayer lamp in the treatment of lupus. He indicates its efficiency by pointing out its economic value over that of the older Finsen model. He distinguishes four methods of quartz lamp application: white light "distant" exposures, blue light "distant" exposures, white light, exposures with compression, blue light exposures with compression. The first type produces severe superficial reactions, the blue type produce deeper penetrating effects with consequent benefits where deeper parts of the skin need stimulating. In refractory cases or deep-seated infiltrations it is often necessary to open up the tissues by cautery or caustics.

Treatment of Radiating Neuralgiaform Pains in Rheumatism. Erich Plate.

Brit. Jour. Phys. Med., **7**:39 (June) 1932.

The author develops his thesis by first describing the various theories of its anatomico-neuro-circulatory function and action under normal and abnormal states. He calls attention to postural changes and the limitation of motion found in people suffering from neuralgiaform affections. The radiation of pain is due to pressure effects upon local nerves, and the elicitation of signs such as Leségue and others is an index of local nerve involvement. The treatment varies with the location of the affection but heat is an indispensable agent. It should, however, not be penetrating in the acute type or else it will set up further pain. Massage is best given very gently over the indurated areas located about the affected part. The author advocates massage under water, the bath tub method, in which the temperature is at body heat, this to be followed by dry massage. He also advocates the injection of 25 cc. sterile novocaine in or about the painful areas, rest of the affected limb in position of least tension, corrective exercise in order to prevent faulty posture. He claims to have been successful by this régime in 1,400 cases of sciatica alone.

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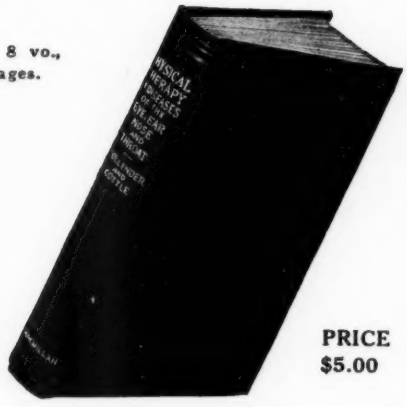

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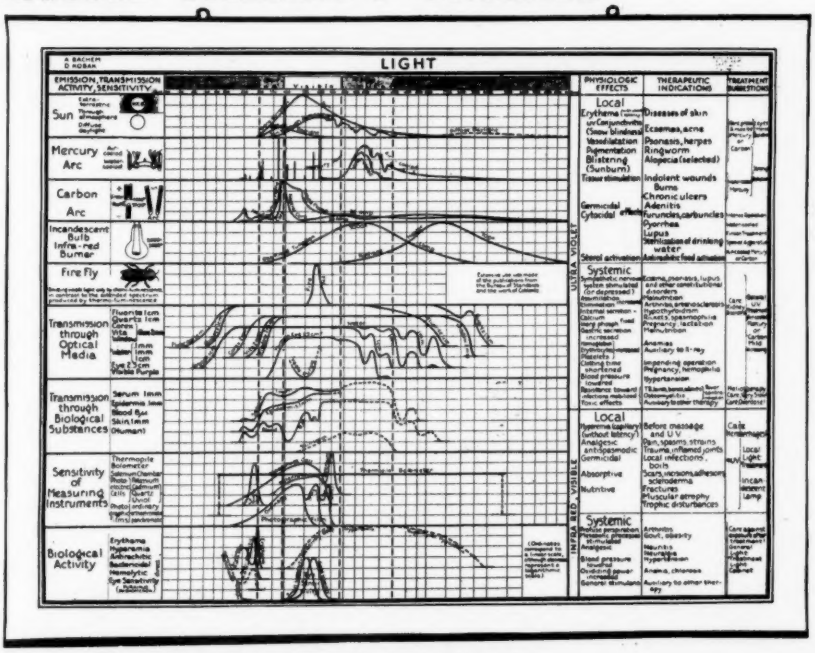

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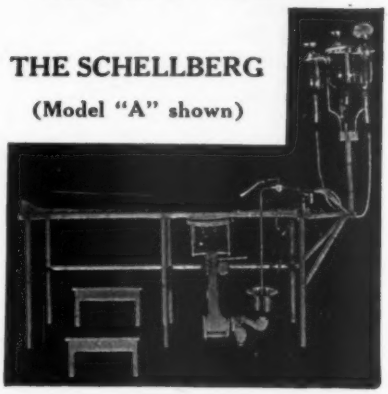

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